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Journal of Electricity and Western Industry

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January 15, 1922

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These
Advertisements

Keep a record today of the time and thought you give to the kitchen. Show it to your husband, and then—but that would be telling.

m-m-m what cooking!

are only a few of the "teasers" that start a campaign with which you can move a large quantity of Crawford Electric Ranges out of your showrooms onto your domestic meters; they are not half as interesting here as they are when you see them in their place in "The Crawford Plan."

You want to see that plan—every commercial manager who is after range business (and that's what he is after) owes it to himself to examine every one of the carefully-plotted steps in The Crawford Plan.

If you want to see it, say so to Burton Y. Gibson, the Crawford representative on the Coast, at 680 Folsom Street, San Francisco; or, ask any Western Electric Salesman.

The best way to cut down *your* cost of living is to use *all* of the food you buy

-m-m-m What Cooking!

10

women in this city are going to win a prize next week. And a whole lot of families are going to eat better than they ever thought they could.

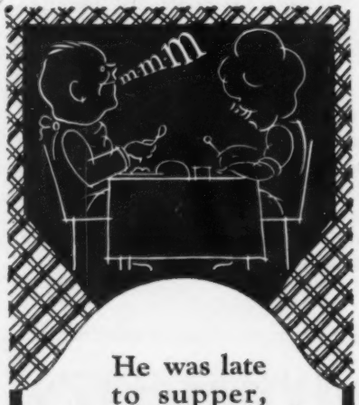
m-m-m what cooking!

Crawford
ELECTRIC RANGES

Made by
WALKER & PRATT MFG. CO.
Boston

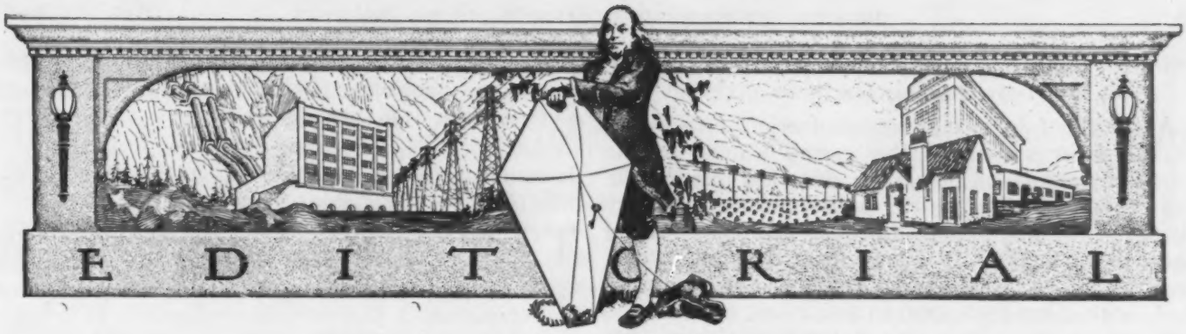
Distributed by

Western Electric Company
INCORPORATED
Offices in All Principal Cities



He was late to supper, but the food wasn't burnt or cold or anything. Why, this must be Heaven!

—m-m-m!
What cooking!



"By Their Fruits Ye Shall Know Them"

THE State Railroad Commission of California, since its reorganization in 1910, has established an enviable reputation for impartiality and justice. Its decisions have been quoted by the courts and by other commissions and the opinions of its leaders have been sought on questions of national importance.

THE Journal of Electricity and Western Industry has repeatedly championed in no uncertain terms the principles of private ownership of public utilities under commission regulation. It is proud of the tradition and reputation of the California commission. It believes that sound utility regulation as practised by the California commission is the corner stone of industrial prosperity.

UTILITY regulation should be no more connected with politics than the Supreme Court of the United States. Recently considerable comment has arisen in the press, and elsewhere, caused by eleventh hour appointments to fill four vacancies on the State Railroad Commission of California. The manner of these selections was unfortunate. The outgoing governor, who had failed of re-election by a large majority, took advantage of an opportunity to fill existing vacancies with his own appointees, for whose acts the new administration will be held responsible. It is regrettable, indeed, that appointments to a body of such importance should savor in the slightest of rewards for political service. Yet regardless of the qualifications of the new commissioners, it has been pointed out that two of the appointments appear to be just that.

WHEN the State Railroad Commission was reorganized, apprehension was felt that the commission might be used as a means of serving the ends of partisan politics, that the almost plenary power vested in the commissioners, if injudiciously exercised, might seriously retard, even wreck, the industrial development of the State. At best, it was regarded as an important experiment in political economy, the result of which was awaited with anxiety.

THE basis of the apprehensions of the people was that of personnel. Would the Governor's appointees measure up to the grave responsibilities of their office? The answer is found in the story of the growth of California's public utilities, a growth unparalleled in history. To John M. Eshleman, Max Thelen, E. O. Edgerton, and their associates is due the credit 1or having created a new concept of the efficiency of private ownership and development under impartial state regulation. The rights of the consumer, and of the stockholder have been conserved. Electric service is furnished at reasonable rates, and the securities of California electric utilities are regarded as among the soundest in the nation.

NO greater misfortune could befall California than to have public confidence in the commission disturbed. But—institutions with a reputation and a tradition for impartiality and high standards have a way of carrying on through successive administrations. It is also true that a vigorous advocate often makes an excellent judge. Therefore, regardless of the past affiliations of the members of the new California State Railroad Commission, whatever they may have been, they should not be pre-judged. They are entitled to a chance to show, by their acts, that they propose to maintain the honorable traditions established by their predecessors. They are entitled to a square deal, without prejudice and without favor.

THE Journal of Electricity and Western Industry feels confident that the Railroad Commission of California is composed of sincere men of high ideals, but it resents the intrusion of "politics" into the selection of men called upon to exercise a vitally important judicial function.

Electric Heating Should Not Be Unwisely Discouraged

ALMOST interesting communication appears in another section of this issue, which, as the writer suggests, is deserving of wide circulation. The communication states, in effect, that electricity is never destined to supplant other fuels for heating residences or offices on a large scale, because the current cannot be produced at a cost low enough to compete with other fuels even in a territory where fuels are very costly. It is also stated that the heating business is not generally a desirable load since the seasonal peak for this type of service coincides with the lighting peak.

The Journal of Electricity and Western Industry has given some backing to the idea of the practicability of electric house heating in the past. We hold no brief for the "chimneyless town"; because there is not enough electricity capable of generation entirely to supplant other fuels, if such demands were ever made, and it is improbable that such will occur. But we do believe that electric heating has its place.

Untruths, half-truths and statements as to "cheap hydroelectric power" appearing in newspapers tend to give a wrong idea as to the possibilities of electric heating. It should not be absolutely condemned, however. There is a real province for electric heating. Under certain conditions it is actually cheaper than other systems, as has been demonstrated in certain sections of the West where the gain made by doing away with a janitor and a lowering of insurance rates has more than made up for the increased cost of electricity. This condition is not generally true throughout the West. In most cases electricity is more costly than other methods of heating.

While it is probably true that electric heating must be classed among the luxuries, this, however, is not a fundamental objection. The power company which would attempt to discourage the use of electricity for heating because it believes it would prove too heavy a burden upon its consumers' pocketbooks, is doing harm not only to itself but to the entire field of electric use. Let the power company furnish power at such rates as will furnish a reasonable return on its investment, not attempting to make too much of a sacrifice in order to further this load. It should publish the facts of the case in detail, allowing the customer to know the full expense which he will have to bear and then let him use electricity for heating if he so desires.

People are inclined to do what they want to do, regardless of advice. Well meaning economists have deplored the tendency toward extravagance in people of modest income in the purchase of automobiles. Yet the demand for automobiles has persisted, as will electric heating. The public will buy electric heating, and automobiles, and pay the price. If a power company takes the position of actively discouraging this vision of electrical comfort which the public has made for itself, it will merely arouse a feeling of resentment which may eventually result in the public's acquiring a power system of its own where it can have what it wants. In so far as power companies are successful in discrediting the use of electricity in this field, they to some extent discredit electricity in every department.

Immediate Need Exists for Study of Distribution Costs

THE general problem of the distribution of commodities is one that may well engage the attention of all those who are responsible for the organization and operation of the electrical industry. It is clear that one of the largest problems that industry, in general, and the electrical industry in particular, must attempt to solve within the next decade is the problem of simplifying and perfecting an economical system of distribution that will meet our particular economic situation. We have been more interested in the primary problem of production than in the secondary function of distribution. Hence, while the past half century has witnessed a remarkable increase of efficiency in production, resulting in large part from the careful study of production costs with, naturally, a tendency to a continuous decline in these costs, marketing costs have received little study, with the equally natural result that the cost of distribution has increased both positively and in proportion to the cost of production.

Intent upon the project of developing and perfecting large scale production methods, business executives have not fully realized that, as the size of the manufacturing unit has grown, the problem of distributing the product has changed. With the increase in the amount of a commodity manufactured in a particular district has come the necessity for the distribution of the commodity over larger areas. Naturally, in order to cover the additional expense, prices have increased until the margin between the ultimate selling price to the consumer and the manufacturing cost is so great as to cause comment.

During the past few years the retailer and the wholesaler have begun to see the necessity of studying that phase of distribution for which they are responsible. Several trade associations, in lines other than electrical, have cooperated with economists in the effort to compile accurate statistics and to deduce from them certain working principles. Merchandising, both retail and wholesale, costs too much; whatever the cause or explanation, whether it be wasteful competition or inefficiency, we must know the facts before we can attempt the solution of the problem.

The problem is not new. It has been recognized for some time that facts were needed, but until recently no agency existed in the electrical industry which could properly undertake the task. With the organization of the Joint Committee for Business Development, an agency adequately equipped to attack the problem is at hand.

In line with the suggestion in the Committe's announcement of objects and purposes, appearing in the December 15 issue, that definite plans or activities be suggested, we propose that a study be made of distribution costs within the electrical industry.

Adages Are the Fruit of Knowledge and Long Experience

THE old saw that "the best booster for business is a satisfied customer" has been revamped and revised, used as an advertising slogan, employed as the theme for everything from speeches to circular letters and has been badly overworked. It is one of those self-evident truths of which we are apt to say "I know that" and immediately forget. Occasionally we find a man, who, believing in the logic of the phrase, applies it to his business and prospers.

Such was the contractor-dealer who installed a radio receiving set in a home which housed a bedridden wounded soldier. For sentimental reasons or otherwise he took especial pains with the installation. The goodwill which he created by his interest, and the success of the installation resulted in the sale of an electric range and an electric washer in this home. He made a friend and a booster for his business. So pleased and enthusiastic was the housewife that she gave him the names of four of her friends who were contemplating the purchase of washing machines. He made four sales and four more friends. Today he employs three salesmen, all of whom work upon a prospect list which has been compiled in this manner.

In recounting this experience the contractor-dealer said, "Believe me, the booster for business is a satisfied customer." We agreed with him and have not forgotten. The phrase may be overworked; it may be trite, but it is true.

The Electrical Merchant's Day to Promote Show Window Lighting

SHOW window lighting presents a comparatively undeveloped market of large proportions, and an analysis of the central station load in the West shows that the activity ranks well up among the major sources of power company revenue. To assist the industry in developing this market a movement has been launched by the California Electrical Cooperative Campaign to promote better show window lighting. An exhibit of a model window with proper convenience outlets and other electrical accessories will be brought into the various meetings of business men in the metropolitan centers. The idea is to stage an electric merchant's day on such occasions, in which the appeal will be made to the merchant for better window illumination. The electrical men themselves on these occasions will remain in the background and the merchants of the communities will be given free opportunity to express themselves on the good results to be obtained from better window lighting. The cost of such an exhibit and the amount of money necessary to hold meetings is not excessive. An exhibit of this type will have beneficial effects if pushed during the summer months, prior to the fall buying period. There is a great need for better lighting and this can only be brought about by a knowledge of the basic principles of wiring, color schemes and other things concerned with show window lighting. Now is the time to begin the planning.

California Leading State in Hydroelectric Production

A REPORT recently issued by the United States Geological Survey on the water power production of the United States for the first seven months of the past year shows that California led all the other states in the production of hydroelectric power, producing 21.4 per cent of the total hydroelectric output of the entire country.

During the seven months' period a total of 10,239,366,000 kilowatt-hours was generated in the United States, of which 2,199,945,000 kilowatt-hours were generated in California. New York, with its Niagara Falls Development, ranked second with 1,652,853,000, Washington third, with 687,992,000, Montana fourth with 534,252,000, and South Carolina fifth with 500,877,000. All the other states combined produced 4,663,447,000 kilowatt-hours. Another significant fact brought out by the survey is that during the seven months the California output increased 48 per cent as against an increase of only 7 per cent in New York.

The Mutual Obligations in Industry Should Not Be Disregarded

THE workers who contribute their labor to a given business, the individuals who invest their savings in the undertaking, and those who direct its operations and policies, must all receive their return from the earnings of the enterprise. It is to their common interest that those earnings should be maintained at the highest level attainable.

Earnings increase as productive efficiency and selling service improve. This improvement may result from added effort or capacity on the part of employees; from superior intelligence of management in the conception and application of new and ingenious ideas and methods which secure the result without additional effort from the workers; from greater contributions of capital by the stockholders, making possible extension and improvement of facilities with the consequent increase of capacity; or preferably from a combination of all three factors.

There is, then, a partnership of interest among the three essential elements of industry which demands cooperative recognition by each. None may selfishly or unjustly view the position of the others without destroying the opportunity for the success of all. None may ignore the true interest of the others without defeating the primary purpose of its own participation in the joint undertaking.

Human instinct is fundamentally selfish and self interest has always tempted men in every walk of life to ignore, more or less, their obligations to their fellows when by so doing they seemed to improve their own economic status.

Intelligent men in industry are now quite generally convinced that in the final analysis it is not to their best interest to disregard their responsibilities toward those in their employ and the demonstrated success of many efforts in the nature of cooperative action has long since removed the matter from the experimental field.

CURRENT COMMENT

Denver Bank Proves Value of Electric Idea

One of the national banks in Denver early in 1921, as part of the extensive advertising campaign instituted a course of instruction in budgeting of personal accounts both for customers and outsiders. At the conulusion of the first year, prizes were offered for reports on individual accomplishments in budgeting and the most interesting factor developed in nearly all the reported experiences was the part electricity played in economizing in the home. And now, after another year of experimentation in this line, the bank has issued a similar report and frequent mention is made of laundry equipment, heating appliances, and other electrical devices which have assisted in establishing thrift in many Denver households.

One family with a monthly income of $205 was able to save 10 per cent of that amount because, as the housewife said, . . . "Having all modern electrical conveniences helps us to save in operation, so our percentage here came to just the estimate."

What better selling talk could be found for the electric washing machine than the statement of this Denver woman—"I do all my work with the help of an electric washing machine. This not only saves the wages paid to help but I am much more saving with gas, electricity, soap, and wear and tear than I could expect any kind of help to be." Some progressive ironing machine representative is going to sell that woman one of his machines and he will experience little resistance, if any, because that particular housewife is sold on the idea already.

Confirming the economy of operation in this case, are the figures of $256.10 for the entire household in eleven months and of this amount gas and electricity totaled but $44.98, or a trifle over four dollars a month.

Another case, that of a family of four with an income of $120 a month, where thrift and economy must be practised but where the principal labor savers are much in evidence, is explained in the statement of the husband, a bookkeeper, who says, "We try to keep below $4.00 per month on the gas and electricity, which covers current for the electric washing machine, iron, toaster, vacuum sweeper, besides gas for cooking and lights."

Lack of income has prevented another Denver family from enjoying the fruits of electric labor-saving devices as well as a telephone. Music was included in the same class. However, in the 1923 budget of that family, provision is being made for these features and a washing machine and other appliances can be considered as sold already, if only a progressive merchandiser makes an early contact.

These are reflected as concrete instances where the idea—the service resulting from an intelligent application of electricity—has made home life easier. In no case can it be supposed that any of the accomplishments were due to one particular type of machine as compared with another but rather, as is known in several cases, the washing machines referred to are near the top in prices.

Someone sold the idea to those budgeteers in keeping an intelligent check-up on household operations, and as a result, a clearly defined conception has been obtained as to the part electricity has assumed in solving the problems of the home.

Universities in Colorado Teach Utility Subjects

Electricity, gas and the telephone and street railway are going to college—not figuratively, but literally. In recognition of the every-day importance of the industry which furnishes these three vital things, every university and college in Colorado will take up their study from an economic standpoint. "Beginning immediately after the first of the year the students of the University of Colorado, Boulder; State Agricultural College, Fort Collins; State Teachers College, Greeley; School of Mines, Golden; Colorado College, Colorado Springs, and Denver University will take up the study of the economic phases of the electric light and power, telephone, gas and street railway business. Colorado, long recognized as one of the most progressive states in the Union with respect to its institutions of higher education, thus takes another advanced step.

The idea of making public service a university study originated with one of the state's leaders in educational matters. In keeping with their avowed desire to make an open book of their affairs, public service companies of the state readily adopted the suggestion. These organizations, through a centralized agency, on request of the institutions, will provide a part of the data to be utilized in the instruction of classes and seminars. Some of the chief executives of the larger utility organizations of the state, as well as department heads, engineers and other specialists in their particular line, will render direct assistance in the class rooms, when called upon to do so.

The public utility companies' relation to the prosperity and general well-being of every individual in the community it serves; the vital part public service organizations are taking to help restore prosperity; problems of regulation, rate-making and kindred subjects in which everybody is interested will receive careful study in all of the institutions.

Not only will these studies afford the students a more accurate perspective of the public service business as it relates to their future home and business affairs but, in addition, the knowledge thus gained will help to equip them for taking up some phase of activity in this vitally important industry.

1923 Promises Prosperity For Lumber Industry

The combined reports from the various lumber companies in the northwest indicate that the year 1922 has been highly satisfactory and profitable, the car shortage excepted, and that 1923 heads out even brighter than ever. Last year the lumber industry was just recuperating from the losses of 1921. In 1923 it should show a large credit balance, according to present indications.

A year ago mills of the Northwest were just emerging from the very disastrous experiences of 1921, which was characterized by large production and high labor costs, with prices so low that the shipments represented definite losses. The demand for lumber from the agricultural districts virtually ceased and the inability of Europe to pay for lumber caused a large reduction in the total shipments of the year.

Modern Electric Equipment on New U. S. Vessel

No vessel in the world will have finer electrical equipment than the S.S. "Leviathan," taken over from Germany during the war, and now undergoing reconditioning for service in the North Atlantic run at the plant of the Newport News Shipbuilding & Drydock Company. The steamer is the property of the United States Shipping Board. Some idea of the scope of the electrical installation can be obtained from the following facts, taken from the report of Rear Admiral W. S. Benson, commissioner of the Shipping Board.

If all the various size wires in the single and multiple conductor cables were put together end for end, thus forming a single conductor of different diameters along its length, it would reach from New York to Norfolk, a distance of approximately 400 miles, the total weight of this wire and cable being about 360,000 lb. Even this does not cover all the wire on the vessel, for there are many more miles of it concealed in the windings of the various appliances and apparatus.

The number of wires entering a single appliance varies from 1 to 1,300. The cross-section of the wires used for conducting the current between the apparatus varies from 0.0008 sq. in. to 1.18 sq. in. The latest type of Navy standard lead and armored cable is used in all spaces subject to dampness and in all working parts of the vessel. In the passenger accommodations, armored cables are used and every precaution has been taken in their installation to lessen the fire risk, such as the provision of special outlet boxes at fixtures, kick pipes at the decks, guards to prevent injury of conductors and the like. Only about 10 per cent of the original wiring remains in the vessel. Great care has been taken in the installation of the wiring to allow for expansion and contraction. Both the wiring and fittings and all electrical equipment are designed to meet the most rigid underwriters' tests and inspections.

For controlling the electric current in the multitude of circuits 9,000 switches of various types and sizes are used, the largest being capable of handling 6,000 amperes and the smallest 2 amperes.

In order to adequately light the some 4,000 rooms of the vessel, approximately 15,000 lamps are required. Many festoons and the like are also provided for decorating the vessel on special occasions. Some idea of the power required to fully illuminate this vessel can be more clearly comprehended when one realizes that the electric current consumed in one evening between the hours of 7 and 11 would supply the ordinary home for seven years.

California Leads All States in Hydro Projects

California leads every other state in the Union in hydroelectric development, even surpassing New York, which has harnessed Niagara Falls, according to the annual report of the State Railroad Commission. Between $50,000,000 and $60,000,000 a year is being spent by the electric utilities in meeting demands for power, the larger part of this outlay being for hydro projects.

"While it is difficult to visualize this tremendous development," the commission says, "it requires only a moderate exercise of the imagination to sense the industrial and agricultural supremacy that will result from the productive utilization of the inexhaustible water resources of the Sierra."

Discussing electric development with specific reference to the work of some of the larger companies, the report of the commission reads:

> As the commission's jurisdiction does not extend over publicly owned projects, the figures touching development in this report are confined to the undertakings of private companies. During the calendar year 1921 approximately $50,000,000 was expended on electric development, while the construction programs of the larger companies for 1921 call for an expenditure of over $60,000,000.
>
> For the year 1921 Pacific Gas & Electric Company and its subsidiary, Mount Shasta Power Corporation, led in development work, with an expenditure of over $18,000,000, while for the present year Southern California Edison Company heads the list with an estimated expenditure of $22,500,000.
>
> Great Western Power Company in 1921 completed the first unit of its Caribou plant, expending during the year $4,760,000.
>
> San Joaquin Light & Power Corporation spent $7,584,000 in 1921, completing its Midway steam plant and increasing the capacity of its Kern Canyon hydroelectric plant. Its 1922 construction called for the expenditure of $6,374,000.
>
> During the past year the four big power companies—Pacific Gas & Electric, Great Western, San Joaquin and Southern California Edison—developed 170,680 kva., or approximately 227,500 hp.

DISCUSSION

Oregon Professor Holds Electric House Heating Impractical and Uneconomical

To the Editor:

Sir: For some time both the Oregonian Journal and the Portland Telegram have been devoting considerable editorial space to the advocating of house heating by electricity. Through all of the editorials, the low heating rate offered by the City of Tacoma has been cited in endeavor to make rates in Portland the object of unfavorable comparison.

Unsubstantiated statements and vague generalizations which appear too often in the daily press are apt to cause popular misunderstanding of the practicability of electric heating.

I am attaching one of the editorials which appeared in the Portland Telegram and an answer by Professor S. H. Graf, head of the mechanics and materials laboratory at the Oregon Agricultural College, which appeared in the same paper.

To my mind, the answer is a fitting one, coming as it does unsolicited and from a man not in the employ of an electrical utility company. I believe that Professor Graf's letter is of importance and deserves wider circulation, as it correctly recites the situation insofar as the sale of electric energy for house heating purposes at ½-cent per kw-hr., or anywhere near that figure, is concerned.

One of the editorials which appeared in the Portland Telegram follows:

"Waste wood may be seen from any direction looking from any elevated point in Portland. And yet fir wood laid down in the home basement in this city costs $10.50 a cord; ash, $11.50; oak, $13.50. Ten years ago the price was but half this figure. Ten years hence the price will be higher yet, if the diminishing supply of wood has anything to do with the price. It is doubtful if wood will ever be any cheaper than now.

"Domestic soft coal from Wyoming, Utah and Washington costs the householder $15 a ton put into the cellar. Briquettes cost $16.50 a ton. These prices have risen at about equal pace with that of wood. The future increase in the cost of coal will arise from the increase in the cost of getting it out of the mine and transporting it by rail or ship. The supply will not diminish much.

"At the price of coal and wood now ruling, the average eight-room house costs from $125 to $175 to heat for the year. This includes the cost of cooking fuel and that used in heating water for domestic purposes. Tacoma is furnishing all this service at prices that do not at all exceed these figures.

"We are coming eventually to heating all modern homes on this West Coast by electricity generated by water in the hills behind us. In Tacoma is to be seen the first well planted mile post on our road to this much-to-be-desired way of warming our homes and cooking our food. Tacoma's electric domestic heating is on a paying basis. Seattle sees this, and is going in for the same service on a big scale. One year from today Seattle will be warming the house by pressing the button.

"The lugging, the lifting, the laying incident to the use of coal and wood; the chips, and ashes and soot, the coal dust, the greasy smoke that penetrates to the remotest corners of the house, soils and spoils curtains, carpets, clothing and upholstery, smuts the walls and furniture and compels costly cleaning and repainting; the furnace gas that kills the flowers and perchance the whole family—none of these accompany electric heat, light and cooking.

"West Coast weather demands heat in the house only at certain hours of the day. We fire up the furnace for the morning, then throw open the doors to cool off when the day warms up. We fire up in the evening, then throw open the windows when we go to bed. Thus we waste a large proportion of our wood and coal heat.

"Not so with electricity. We switch it on or off in small or large units to fit the need. We use only as much as we need. We can practice close economy on electricity. We have learned how to do that with our electric lights. Let the wood and coal supply wane as it will, our mountain water never ceases to fall and never grows less from year to year. Twenty years from now electric heating in the cities of the West Coast will be as common as electric lighting now is. Long before that time it will be common in Tacoma and Seattle. Will it be so in Portland? Not if we wait for somebody to bring it for us. Tacoma and Seattle are going after it as municipalities, and they are sure to have it at a price that will put it into every home."

Mr. Graf's letter of reply is as follows:

"On November 24 there appeared in the editorial section of the Portland Telegram an article on the heating of homes by electricity. This article was called to my attention in connection with our study of fuels in the materials laboratory, of which I have charge, at the Oregon Agricultural College. In our comparison of various fuels the use of electrical energy for heating has also been considered and your article, therefore, has caused some very interesting discussion.

"We have available the latest report of the light department of the city of Tacoma, from which your data were taken, a bulletin on electric heating of residences by the University of Washington engineering experiment station, the record of the testimony and exhibits and the opinion on same in the matter of the investigation of electric service for

open air heating made by the public utilities commission of the state of Idaho.

"Various other technical articles and abstracts have also been considered and our conclusions are that the questions put by your editorial cannot be answered in the affirmative; at any rate, not without qualifying statements. Most readers, without understanding fully the conditions and the engineering and economic questions involved, will assume from the optimistic tone of your discussion that the general heating of homes by electricity is indeed at hand.

"First, I am going to quote from the Opinion on Electric Heating, Oct. 17, 1919, by the public utilities commission of Idaho:

" 'Electric heating is, from an economic standpoint, a sort of alchemist's dream. We all know that electricity does produce heat, and we all realize and appreciate what a wonderful thing it would be to dispose of our coal piles and ash pits and smoke, dust and cinders, and would, therefore, fain think it practicable. But a most cursory study of the subject, either from the standpoint of thermal dynamics or social or economic science shows that it is utterly impossible.'

"In the minds of many people the word 'electric' is very closely associated with magic, whereas nothing is farther from the truth. To produce a unit of electrical energy requires in each case certain definite equipment involving first cost with inevitable investment charges and depreciation, to say nothing of ordinary operating expenses. Hydroelectric power does not necessarily, or even ordinarily, mean cheap power. The cost of the Tacoma municipal plant (prewar mostly) according to their report was very close to $3,400,000. The power distributed during 1921 amounted to about 75,400,000 kw-hr. If this had all been sold at ½ cent per kw-hr., that is at the heating rate, the income would have been $377,000, or several thousand dollars short of their ordinary operating expenses.

"I understand of course, that the heating business in Tacoma has been handled by so-called surplus power; that is, power which was available due to building the plant larger (in 1912) than necessary for immediate needs.

"It appears (Page 25, Information Book, Light Department, City of Tacoma), that this surplus power is now exhausted. I will quote the paragraph in question:

" 'The heating load was originally intended to be supplied from the surplus water power development at the Nisqually plant, but today this surplus is exhausted so that since January 1 of this year new heating business has been refused until the Lake Cushman plant is completed, or some inter-tie arrangement is made to make it possible to buy the power at a cost as cheap as the selling price.'

"The heating business is not generally a desirable load for electric plants for the reason that the seasonal peak for this class of service comes at the same time of year as the lighting peak. If any considerable amount of heating business is carried and the plant is fairly well loaded it means that, to all intents and purposes, additional capacity must be provided to carry the heating load. Now then, on the average it costs between $200 to $300 per kilowatt capacity for a complete hydroelectric installation, including everything up to the consumer's house.

"This means that in order to heat the average house of six rooms, allowing two kw. per room and an over all efficiency of 75 per cent for the plant and distribution system, there will be required 16 kw. of plant capacity. This involves an average capital expenditure of $4,000. Taking the minimum charges, as in force at Tacoma, the return on this investment would be $108 per year, or 2.7 per cent to cover all costs including interest, taxes, depreciation, maintenance, operation, etc. It is very evident that no municipality, or much less, any privately owned company, could do business on this basis.

"To indefinitely carry a deficiency due to heating load, which is not supplied by current from surplus capacity, is not justifiable from any standpoint. It means that the man who operates motors, or uses lights, must help pay for heating his neighbor's house.

"The economic absurdity of installing plant capacity primarily for heating is thus plainly evident. Cases where surplus power is available will, of course, exist from time to time. In such cases as in Tacoma it may be feasible and expedient to sell the power for heating but this can be considered only temporary. When the lighting and power demand increases to the plant capacity the electric heating load will become an actual disadvantage and source of loss to the electric company because the current cannot be produced at a cost low enough to compete with solid and other fuels at present, even in this territory where fuels are very costly.

"Even at one-half cent per kw-hr. electric heating for the same amount of heat will cost from 25 to 50 per cent more than other fuels. Take for example the average six-room house, as before mentioned. The minimum electric heating cost for this with two kw. per room will be $108 per year (Tacoma rates). At one-half cent per kw-hr. this will buy 21,600 kw-hr. One kw-hr. is equal to 3,412 B.t.u. Therefore, the $108 will buy 73,700,000 B.t.u. To supply this with $12 coal (assuming 12,000 B.t.u. per pound and 45 per cent furnace efficiency) will cost $82; with soft wood at $8 per cord, about $62.

"Your editorial stated that the average electrically heated home in Tacoma uses each year about $80 worth of heat, but the University of Washington engineering experiment station bulletin No. 15, above referred to, tabulates in detail the various classes of users and discloses the fact that this average includes a good many homes in which there is auxiliary heat in the shape of wood ranges, heaters and fireplaces. Anyone assuming that an average sized home is being heated electrically at this small cost will find that he is mistaken.

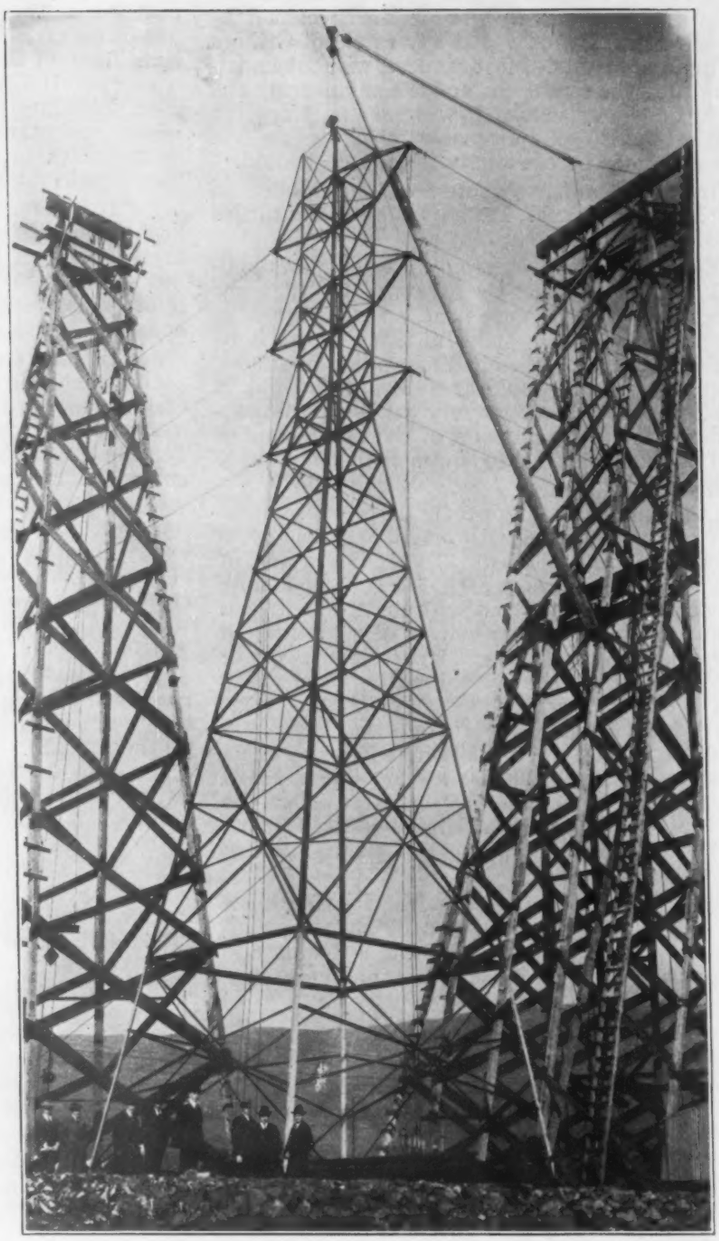
"S. H. GRAF.

"Dated Dec. 6, 1922."

Unfortunately my recollection is that the Journal of Electricity and Western Industry has given some backing to the idea of the practicability of electric house heating, perhaps more in connection with such applications in California than elsewhere, but nevertheless, as I remember it, there have been no articles to discourage this idea.

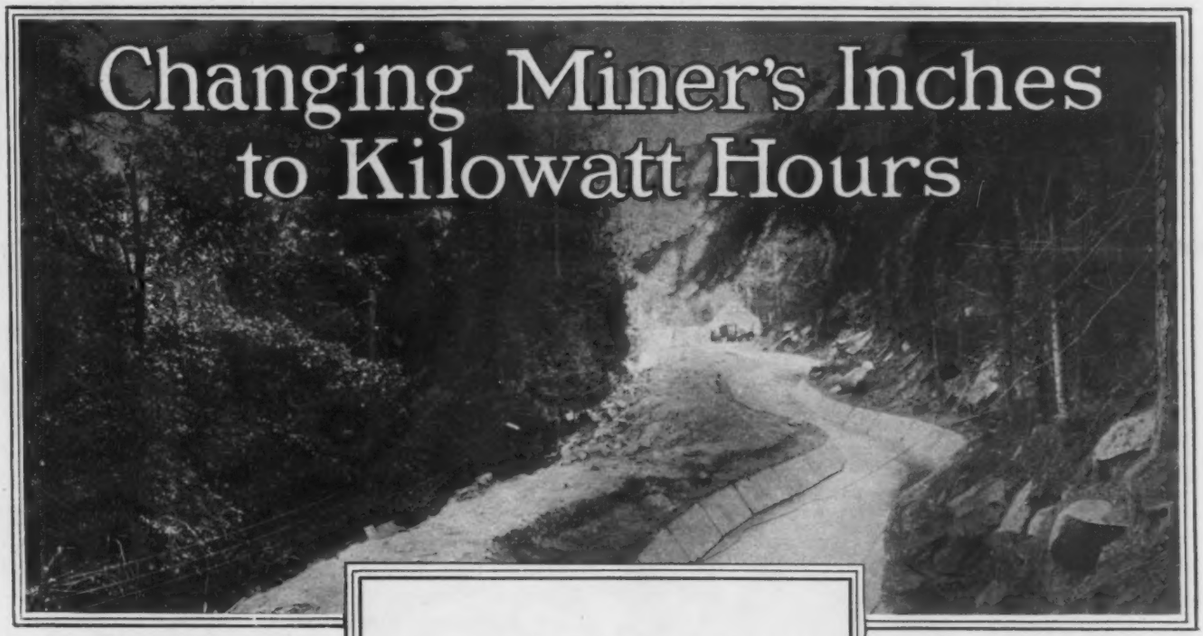
A. C. McMICKEN,
Sales Manager,
Portland Railway Light & Power Company.
Portland, Ore.,
Dec. 18, 1922.

Proving the Margin of Safety for Western Transmission Lines



HIGH tension transmission towers carrying immense blocks of hydroelectric power at record voltages from the mountains to the agricultural and industrial centers of the West must have adequate strength to withstand every possible condition of load strain. Each type of tower must have a generous margin of surplus strength beyond the requirements of all actual loads under all conditions of wind and weather. The illustration shows a test on the dead-end and angle type tower to be used on the new Kings River line of the San Joaquin Light & Power Corporation. A combined horizontal pull of 44,900 lb. is being exerted on the crossarms with 12,600 lb. vertical load. The test was conducted at the South San Francisco plant of the Pacific Coast Steel Company whose shops have turned out towers for several of the West's highest voltage lines.

Changing Miner's Inches to Kilowatt Hours



By George C. Tenney

HOW the Western States Gas and Electric Company is reconstructing a ditch, originally built by California Forty-Niners for placer mining purposes, in the development of 27,000 horsepower of electrical energy.

SIXTY years ago when mining was the chief industry in California, a group of mining men with the intention of operating on a large scale, constructed the El Dorado Ditch along the canyon walls of the South Fork of the American River in order to have sufficient water for their placer mines. Since that time the placer mines have been abandoned, but the ditch has been continued in use, first to supply the town of Placerville and later to irrigate the farms in the valley below. Within the next twelve months, this ditch, rebuilt and enlarged, will discharge its water into the penstocks of the American River plant of the Western States Gas & Electric Company, generating 26,800 hp. of electric energy for use in mines, factories and homes. The construction project, which includes the creation of a series of immense storage reservoirs in the high Sierras, the rebuilding of the historic ditch and the erection of a hydroelectric plant above Placerville, involves the expenditure of $5,000,000.

The Western States Gas & Electric Company, a subsidiary of the Byllesby Engineering and Management Corporation, was incorporated in 1910. It was a consolidation of the properties of the Stockton Gas & Electric Company, the American River Electric Corporation, the Richmond Lighting Corporation, the Humboldt Gas & Electric Company, the Eureka Lighting Company, the Arcada Lighting Company, the Ferndale Electric Lighting Company and the Fortuna Lighting Company, all in California. The total annual gross earnings of the entire group of small utilities did not exceed $750,000 at the time of consolidation but during the past twelve years the business of the company has increased to such an extent that for the year ending Dec. 31, 1922, the gross earnings will exceed $2,700,000.

The company consists of three divisions. The Stockton division, which is the most important, comprises El Dorado, Amador and Calaveras counties and portions of Sacramento and San Joaquin counties. Approximately 70 per cent of the company's load is in this district. The Richmond division comprises the city of Richmond and adjacent industrial territory. The Eureka division includes Trinity and Humboldt counties.

Power is supplied to the Stockton division from a hydroelectric plant with a capacity of 8,100 hp. on the South Fork of the American River and from a steam plant in the city of Stockton. The company also operates a steam plant in the city of Eureka. So heavy is the demand for power in the districts served that the bill for power purchased from other California utilities for distribution over the lines of the Western States Gas & Electric Company exceeds $400,000 annually. It is in order to eliminate the necessity for purchasing power and to insure its consumers sufficient power to meet their future needs that the American River project has been undertaken.

Diversified Character of the Load

Few utilities have as diversified load as the Western States Gas & Electric Company. Electric

energy is supplied for the operation of lime quarries, quartz mines and gold dredges in the mining district. In addition to its lighting load, urban and interurban traction companies purchase power from the company and fully 20,000 hp. in electric motors for irrigating farms in the San Joaquin valley is connected to the company's lines. Included among the industrial users of power in the Stockton division are brick yards, electric furnaces, tanneries, two tractor factories, flour mills and box factories. Power is also sold wholesale to the city of Lodi for

Guniting the core wall of the Twin Lakes dam. Caterpillar tractors are used to pull trains of three LaPlante-Choate wagons and to haul a grader to level dirt. The steam roller packs the soil after it is graded.

distribution. Considerable encouragement has been given to electric cooking, especially in the rural districts, there being at the present time 233 electric ranges connected to the lines. These, together with the water heaters which have been almost universally installed in the farm homes along with the ranges, comprise a connected load of approximately 1,500 kw., the revenue from which averages $1 per kilowatt of connected load per month, a remarkable record for this type of installation.

The following is a tabulation of the number of consumers in the Stockton division:

Lighting	15,538
Power	3,213
Ranges and water heaters	233
Commercial power	946
Irrigation	2,034

American River Development Program

The program of development under way on the American River at the present time includes essentially the following:

1—Construction of a new power house in the canyon of the South Fork of the American River, about 14 miles above Placerville. Two units of 10,000 kw., or 26,800 hp., are to be installed. Ultimate development to be 8 units, or approximately 100,000 hp.

2—Enlarging and lining of the 23 miles of El Dorado ditch, from the forebay above the new power house to the intake on the American River, near Kyburz, just below the mouth of Silver Fork of American River, which carries the water from Silver Lake and Twin Lakes.

3—Construction of penstocks. The water wheels in the power houses will operate under a 1,900-ft. head.

4—Construction of a 45-ft. main dam and 26-ft. auxiliary dam at Twin Lakes to create a storage of 16,000 acre-ft.

5—Construction of a diverting dam in the South Fork of American River at head of El Dorado ditch just below Kyburz.

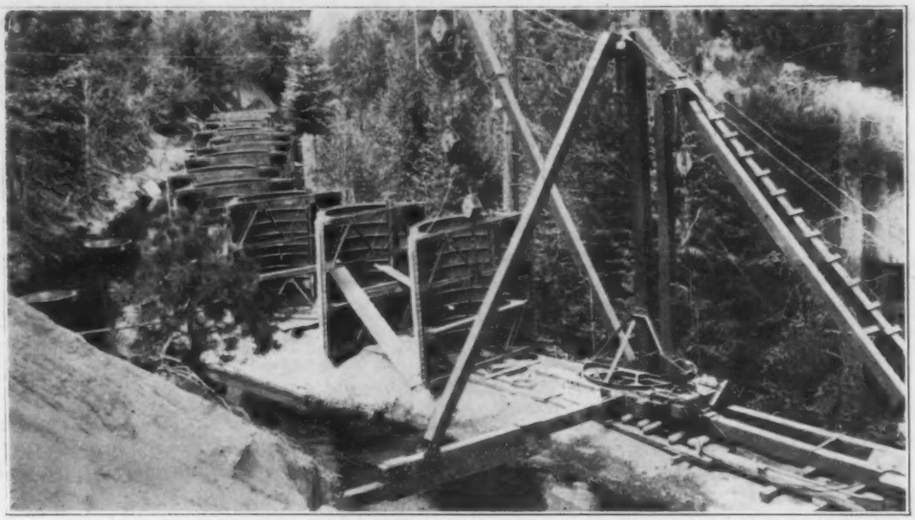
6—Construction of a double transmission line to connect new plant with present transmission system.

The potential storage which it is proposed to develop is about 93,000 acre-ft. in six reservoirs, some of which are already existent. The program is as follows:

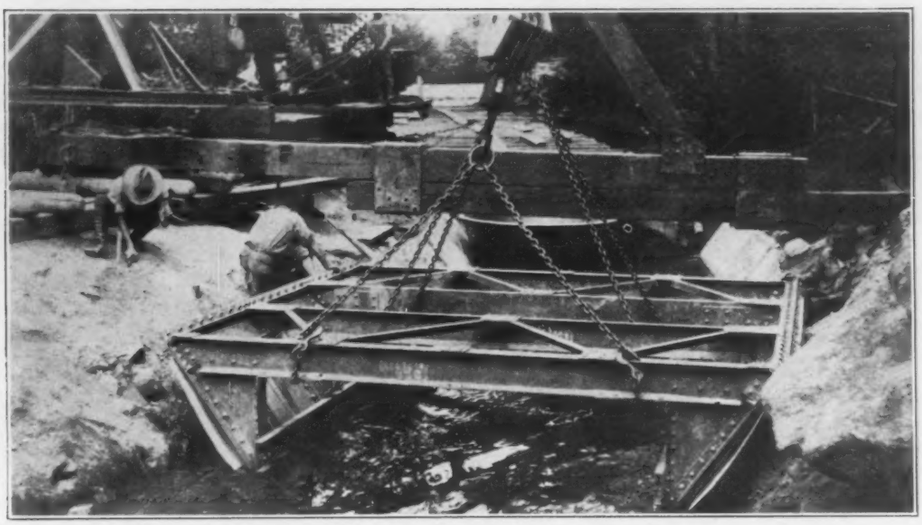
(a)—Twin Lakes: Present, 16,000 acre-ft (after completion of dam under construction); ultimate, 25,000 acre-ft.

A closeup of the details of the rip-rap or wood panel lining is shown on the left. The panels are made of 12-in. boards and are 6 ft. wide. They overlap and are held in place by pipe driven into the bottom of the canal. On the right is a completed section which has been concrete lined. Seams between slabs will be closed with gunite when the ditch is unwatered. Note the material tubs shown in the ditch.

Concrete being placed upon the steel forms by use of the gunite machine



Showing derrick for lowering the steel forms holding concrete slab



Lowering precast reinforced concrete slab in the El Dorado ditch

(b)—Silver Lake: Present, 5,400 acre-ft.; ultimate, 25,000 acre-ft.

(c)—Echo Lake: Present, 2,000 acre-ft.; ultimate, 2,000 acre-ft.

(d)—Medley Lakes: Present, 5,000 acre-ft.; ultimate, 10,000 acre-ft.

(e)—Alder Creek reservoir: Present, 5,000 acre-ft.; ultimate, 25,000 acre-ft.

(f)—Plum Creek reservoir: Present, none; ultimate, 6,000 acre-ft.

Chief among the engineering difficulties which have been encountered has been the reconstruction of the El Dorado ditch to eliminate leakage, which has averaged one per cent per mile, and to do away with the formation of ice in the ditch during the winter months. This has been solved in a novel manner. The contract which was entered into with the El Dorado Water Company at the time the ditch was purchased called for the delivery of 40 sec.-ft. of water from May 15 to Oct. 15 for irrigation purposes; and 6 sec.-ft. during the remainder of the year for domestic use in the city of Placerville.

Laying Concrete Under Water

Consequently all construction work on the ditch has been done without shutting off the water. In places where the greatest leakage occurred the ditch has been concrete lined. Steel forms have been built on which the reinforcing material has been stretched. These forms are covered with concrete by means of the gunite process. They are then carried down the ditch to the place where the concrete is to be laid. The forms are lowered into the ditch to the proper level, the intervening space is filled with sand and the steel form covered. The joints between the concrete sections will be filled with concrete during the winter months when the water can be shut off for four days each week. The steel forms are then returned to the base of operations in a specially built steel boat, where they are again covered with concrete. In sections where the leakage is not excessive the ditch walls have been lined with wooden panels joined together with sections of pipe. The entire ditch will be concrete lined at a later date.

Although a portion of the main state highway to Lake Tahoe parallels the American River, the transportation problem incident to reconstructing the ditch has been a difficult one. The difficulties were overcome in a novel manner. Supplies are carried in motor trucks to the intake of the ditch near Kyburz, where they are placed in tub-like steel boats and floated down the ditch to the point where they are to be used. The boats require no attention as they are carried along by the force of the current. When emptied the boats are floated to a point where the ditch again meets the highway, and are there removed, stacked on motor trucks and hauled back

Excavation for the foundation of the power house on the bed of the South Fork of the American River

to the intake. Transportation costs have been cut from 25 cents a ton-mile to 2.5 cents by the use of these boats.

From Forebay to Power House

Water from the ditch will empty into a forebay having a storage capacity of 1,200 acre-ft. of water, a quantity sufficient to run the turbines 48 hours should an accident occur which would require the shutting off of the water at the intake. The ditch

The headquarters camp and office of the El Dorado development early in December. Climatic conditions are such that construction can only be carried on for a few months during the summer. On the right is seen the conduit through the Twin Lakes dam. Note the excavations from which the dirt used in the construction of the dam is being removed.

will have a capacity of 120 sec.-ft. of water. Its construction has been such that it may be increased to 350 sec.-ft. by the addition of a concrete shoulder when the demand for power requires the installation of additional units at the plant on the American River. From the forebay a two and a half-mile pipe line will carry the water to the surge chamber at the head of the penstocks. The pipe line grade extends along cliffs of solid granite which necessitated the use at one point of a charge of 14,375 lb. of powder to blow away the projecting rock. From the surge chamber the penstocks, which have an initial diameter of 52 in. and a final diameter of 30 in., drop 1,900 ft. to the power house. To facilitate the handling of material along the penstock line, a tramway is being constructed parallel to the penstock.

The site of the power house has been connected with the outside world by the construction of three miles of road down the canyon wall. In many places the grade exceeds ten per cent. Roads have also been constructed to the various reservoir sites.

From the power plant, a 110,000-volt steel tower transmission line is to be built to connect the plant with the present transmission loop of the company. The timber has been cleared from the right-of-way and a 60,000-volt temporary line constructed to furnish power for the construction work.

Work at the various reservoirs and on the ditch can only be carried on for a few months during the year by reason of heavy snowfall during the winter. Consequently during the summer months the working day is 24 hours long. Through the aid of powerful electric lights steam shovels load rock and gravel into dump wagons day and night for the construction of the dam at Twin Lakes.

At the present time work on the project has been fifty per cent completed and the company expects to place the plant in operation during December, 1923.

In the terms of energy the development will add 20,000 kw. to the interconnected power system of the Pacific Coast. In terms of the benefits which will accrue it means the conservation of one of Nature's great resources to serve a beneficent purpose—the harnessing of vast quantities of water which, when converted to electrical energy will run factories, light homes, streets and stores, pump water for irrigating farms and operate countless labor-saving and comfort-bringing devices in homes and offices.

The Electrical Dealer's Problem

By C. Wilbur Fritz*

WERE one to look over the financial statement of the average electrical dealer, particularly one specializing in household appliances, such as washing machines, etc., he would find a very large part of the dealer's assets to be in Contracts Receivable and an excessive item of Bills Payable among his liabilities, and the more merchandise he sells, the larger become both items. This condition, temporarily, need cause the dealer no great amount of worry, providing he takes the necessary steps to overcome it. It can easily be overcome through a proven satisfactory method of finance.

There is an element in the statement that is vital to the dealer's success and which does not appear on the face of the statement and that is, the ratio of delinquencies in that Contract Receivable account among his assets, for every 30-day delinquency in that account, reduces by just so much the jobber's possibility of obtaining 100 cents on the dollar on his account included in that Bills Payable item among the Liabilities. Every 30-day delinquency reduces the profit on that sale by just so much and a 60-day or 90-day delinquency may change that profit into a loss.

Determine Rate of Turnover First

Every merchant in any business must figure the turnover which he can obtain and base his profits accordingly. A dealer, for example, may buy on a 40 per cent discount basis, and operate on an overhead of 30 per cent, figuring he will net 10 per cent profit or $10 on each $100 transaction and allow that on that basis, he can extend credit with his amount of capital, for 60 days on open accounts. Suppose, for instance, that instead of collecting that $100 due him at the end of 60 days, he doesn't collect it for another 60 days, thereby making a total of 120 days credit extension. Has the transaction then been profitable to him? No, for had his bill been paid when due, he would have gotten another turnover on the same $100 and made an additional $10 which through lack of receipt of the funds due him, he was unable to do, thereby losing the second profit which offset the first and probably caused him to lose an additional cash discount, which with proper turnover he could have taken, so instead of actually profiting by such a transaction, he has lost money. The same theory is applicable to the instalment business and every time a 30-day delinquency exists, a certain proportion of the profit has vanished.

In addition to the loss of profit by delinquencies there is the ever growing risk of ultimate loss, for **the greater the delinquency, the more probable the loss.**

Another item to be taken into consideration is the stock of merchandise carried. I have submitted to me statement after statement with an inventory of 40 to 50 per cent of the total yearly volume of business. Stop and analyze, if you will, a dealer carrying a 50 per cent inventory of his yearly volume. Manifestly, he is getting two turnovers a year on merchandise and if to get a turnover he must extend a year's credit, unless his discounts are exceedingly large and his operating cost proportionately low, he

*District Manager, Republic Finance & Investment Co., San Francisco.

isn't apt to make government interest rates on his capital employed and might far better have his capital invested in government bonds.

The Duties of the Credit Man

I believe the credit man of any organization should carefully watch these various items. Personally I make it my business to occasionally check the Contract Receivable and open account ledgers of our clients to make certain that they are getting their proper ratio of collections to outstanding accounts, for it is certain that if they do not collect the money due them, they can never take care of their obligations to others.

The corrective measures are apparent and a simple set of rules would be:

1. Fix the amount of turnover you must obtain and keep your inventory to a minimum to get that turnover.

2. Collect your open and instalment accounts when due.

Send statements out promptly. If remittances do not come in, use your telephone, and if they still don't come in, go out afte rthem. Be persistent, and don't feel that you will make an enemy of a customer by asking for money when due. If that is the kind he is, you had better get him off your books as soon as possible, for he will surely cause you a loss sooner or later.

3. Pay your own bills promptly.

4. Base your overhead on your present volume of business.

Don't attempt to set the volume of business to meet your present overhead.

For some time I have been of the opinion that an auditor (and a business man) employed by a group of jobbers, would pay for himself many times over by the saving to the jobbers of the many thousands of dollars which they now charge off as losses, as most of these losses are due, in a great measure, to the over extension of credit by the jobbers themselves. Were a man employed to investigate any dealer who failed to take his cash discount after having once formed that habit and to assist any others who may be in need of instruction along sound business principles, the losses would be far less. I believe every dealer would welcome such assistance and even be willing to pay his pro rata share of the expense.

The backbone of any industry is its credit and the only method of keeping the industry sound and healthy, is to keep its credit structure in the same condition and that stage can never be reached until the most vital element—the direct contact with the public—the electrical dealer and contractor, is educated to the point where he can keep his unit of that credit structure sound and healthy.

The contractor's problems are two-fold; to learn to figure a job properly to make a profit, and to learn how to collect his money when due.

With the dealer, we have a more complex problem. He must maintain an organization of appliance salesmen. He must also maintain a delivery and repair department for merchandise sold. He must have a credit department for the checking and verification of all sales made. A collection department must also be maintained, as 85 to 90 per cent of all sales made will be on an instalment basis. And having purchased a bill of goods and through his energies, sold all of it during the month, his next problem will be to figure out how he can pay for a like amount of merchandise for the second month's business.

Presumably he had the cash to pay for his first order, but now he has paid a lot of salesmen's commissions, delivery expense, and advertising—and all he has left is a number of lease contracts—promises to pay. His bank can't handle them because they run for a period of ten months or more and their credit extensions are for a period of 90 days or less, and the dealer cannot repay them on any loan they might make on his contracts in less time than the contracts themselves pay out.

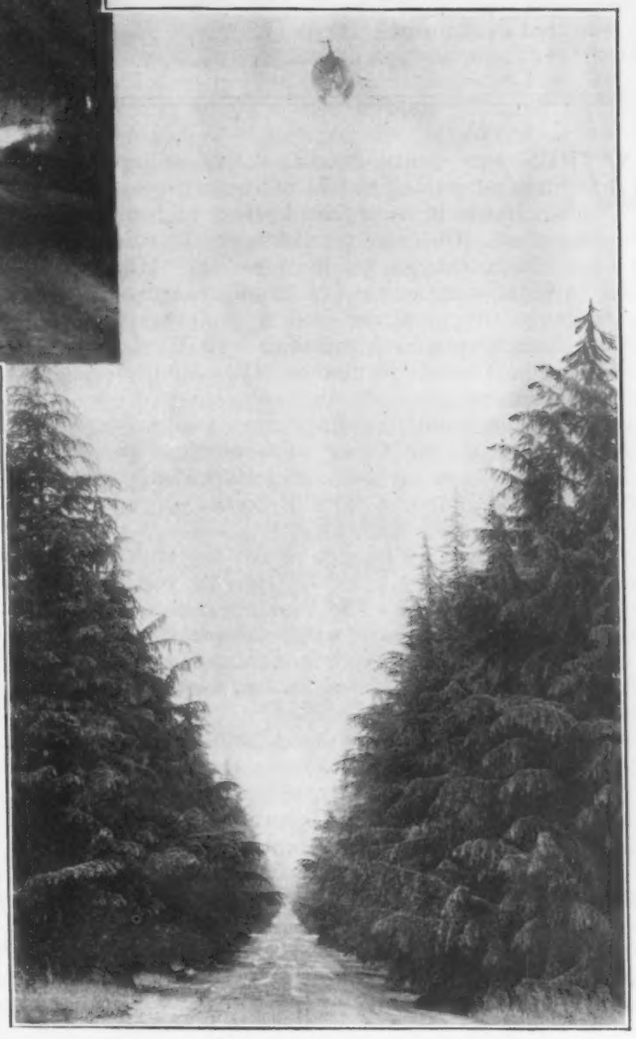
The Function of the Finance Company

However, he can do one of two things—first (the wrong thing), ask extension of time from his jobber on his second bill of goods, or, secondly (the right thing), make proper arrangements with a legitimate finance company for the sale of his contracts to them, providing, however, that he amply assures himself of his ability to make repayment to them out of collections received on his contracts. This means that under no circumstances, should he agree to pay back 100 per cent of his collections, for experience has shown there is no dealer who can collect 100 per cent of the amounts due him. To agree to repay an amount which he knows he will not receive is merely courting disaster.

Having made proper arrangements with a finance company, he sells his contracts to them and receives in cash from them his advance, which should not exceed 80 per cent based on the safety factor from the dealer's standpoint, and he uses these funds for discounting his second bill of goods. The charges made by the finance company have been added to the sales price of the merchandise sold, so the dealer's regular profit is obtained, he has taken his 2 per cent cash discount in 10 days, which amounts to 36 per cent per annum on a 2-10 net 30 basis. If he has not had advanced more than 80 per cent on his contracts and need not repay to the finance company over 80 per cent of the amount of collections due him, he has a factor of safety at work which will eliminate any possible worries and his main efforts can be devoted to seeing how near he can make his collections reach 100 per cent.

Were every dealer to conscientiously follow out these methods of operating his business, and carefully watch every detail, more would show a substantial profit at the end of the year. **The electrical appliance business is a most profitable one** and in addition, a very interesting one, as many can vouch for who have systematically carried it through on proper business lines.

A TRIAL installation of G-E Novalux highway lighting units was made along Santa Rosa road, shown in the accompanying views. The lighting units were placed 28 feet above the road and 540 feet apart. Poles in front of the homes fronting the road were deemed objectionable, and heavy cables stretching across it were in disfavor. The adaptability of the unit chosen made it suitable to these conditions and they were suspended in a center span arrangement from inconspicuous wires strung high overhead. So successful was this installation that a lighting district was established covering about four square miles, containing 270 lighting units.



WHEN the lights of Altadena's new street lighting equipment were turned on, during December, one of the most interesting installations of the kind yet made began operation.

The lighting problem presented was unusual. Altadena is a suburb of Pasadena, situated at the base of the Sierra Madre mountains in California. The district comprises about four square miles and consists of country estates. The thoroughfares are in reality highways rather than streets in the ordinary sense. The residents, while desiring the illumination of these thoroughfares, did not want ordinary street lighting units employed.

Another View of Cooperative Selling

By J. E. Bullard

Cooperation between electrical dealers and a well known furniture establishlishment was exemplified during the June Bride Week held last year under the auspices of the California Electrical Cooperative Campaign. A window in the John Breuner store in Oakland was used to display electrical ware which was to be given as wedding presents to the principals in a "Radio Wedding," one of the features of June Bride Week.

WHEN one speaks of cooperative selling he thinks of an association of competitors who join hands in a combined effort to increase the sales of all. One rarely talks upon the subject very long, even though he lives on the Atlantic Coast, without mentioning California oranges, raisins, walnuts, Oregon apples, and all the other various agricultural products raised in the West and made household words throughout the nation.

This, however, is not the only form of cooperative selling that is being done successfully. More and more we are seeing such combined effort as is indicated when on the billboards appear such phrases as "Mallinson — famous maker of sport silks, says 'wash silks with Lux!' "

One company may be paying for the billboard but two well and very favorably known concerns are lending their prestige to making sales. This cooperation results in a sales value often worth more to each of these concerns in non-competing fields than would be the case if the two names were not combined.

If the plan is properly worked out the result may be a sales energy worth more than twice as much to each of the two concerns than independent selling would be worth. Central stations have made use of this idea to a certain extent by lending the use of their windows to the dealers in the town. The dealer would be allowed to make a display of his goods in the window. A card prominently displayed states just which dealer is making this display. Other cards may call attention to the good window lighting.

The dealer sells more goods as a result of this window display and the central station sells more window lighting as a result of this demonstration, if the idea can be carried out in a satisfactory manner. If the city is not so large that window space cannot be given to all the dealers who desire it, this form of cooperation often results in a much quicker introduction of new ideas in window lighting than would be the case under other circumstances.

However, when this idea is given careful consideration, it is discovered that it takes on more of the form of a demonstration than of actual cooperation. The central station fully expects to sell window lighting to the dealer to whom the window is loaned. If the results of the window lighting appeal to the dealer, he is placed more or less under obligations to buy that kind of lighting.

Last summer a stationer in one of our larger cities staged a cooperative selling stunt that was really cooperative. This stationer arranged with the telephone company to make a window display featuring toll calls and to have in the store a man at an information desk who would explain to the people who came in just how and the best way to make these calls. A card in the window invited those looking at the display to come in for the free information.

To make it still more worth while for the telephone company, this stationer distributed to 5,000 of his out-of-town customers, coupon books. Each book contained 25 coupons, each good for one toll call from anywhere to the stationer. This naturally created a greater interest in toll calls and brought business directly to the telephone company. As it

worked out, however, these coupons brought enough business to the stationer to make the coupons a good advertising investment.

In addition to this, the stationer had near the information desk a display of all the articles he sold which could be used in connection with the telephone. These included memorandum pads, telephone brackets, card directories and numerous other items.

The display in the window and the invitation to come inside for more information brought a great many into the store who would not have come in had the stationer made the display of his own goods. When they were once inside the display tempted them to make purchases.

This display and cooperative effort worked out so well that it was tried soon after with another concern. It is now being made a regular feature of business getting effort on the part of this company.

In the case of the telephone company it so happened that it was a good customer of the stationer and the stationer was a good customer of the telephone company. It was the case of one good customer helping another. In the case of other plans along this same line of cooperation, however, concerns neither buying from nor selling to the stationer will cooperate in a business building effort.

It will be noted that in these plans each party to the cooperative effort gives about an equal amount of time, money and attention to the plan. In some instances it has been a case of combining a selling plan the stationer has found successful, with one the company cooperating with it has found successful. In short, two selling efforts that have been found by experience to be very effective are harnessed together. The result of this team work seems to approximate a doubling of the effectiveness of the plan in the case of each concern. That is, each party secures about twice the sales returns he would if working independently.

One important point in this plan as worked out by the stationer is that each party to the plan must be well established, very favorably known and a rather extensive advertiser. The stationer who conceived the plan believes thoroughly in advertising and has built up his business very largely through the skillful use of the printed word. He considers cooperation only with those concerns which are as well and as favorably known to their customers as he is to his.

The success that has attended his effort indicates to how great lengths it may be possible to carry the plan. When dealers cooperate with each other it is quite obvious that they are doing it for their own interests. No matter how much is done or said, it is not an easy matter to make the people believe that they are being given first consideration.

As an example, the electric appliance dealer doesn't sell silk, but suppose that he arranges for a demonstration of the right way to wash silk with some soap manufacturer or some silk manufacturer. Electrical appliances enter into the demonstration. Each manufacturer has built up a prestige that has caused people to have a great deal of confidence in him. Many people who would not enter the store if the dealer relied solely upon his own prestige, will do so because of the prestige of the manufacturer.

When they come in to see the demonstration, they see just how electrical appliances can be used in the process of washing silk, or in using that particular soap. They are more impressed with the silk or the soap than they otherwise would be—and at the same time the electrical appliances are being demonstrated to them. A double sales effort is the result at the expense of less than one.

But let us go still farther and consider a manufacturer of beds, for example. The dealer doesn't sell beds and apparently has no interest in them. However, this manufacturer has advertised them extensively; his name is well and favorably known. He can make a window display that will attract people to the store. He has something to say about beds that people want to learn. The display is made in the window and the man or woman who is to give the special information is stationed inside the store.

Near this information desk there is a display of lamps that can be attached to a bed, and there are also heating pads, room heaters and various other things that can be used in the bed room. If the plan is properly worked out it can be seen that such a scheme would work to the advantage of both parties.

In the case of these two examples, the objection may be made that the manufacturers have dealers in town, who are selling their products and that these dealers would want the demonstration made in their stores. This may be true and again it may happen that there are so many dealers, many of them very small, that it would not be possible to make a satisfactory demonstration in each store, while if any partiality was shown other dealers would feel slighted and would be inclined to sell as little of the product as possible.

The suggestions made, however, have been made merely to point out the possibilities. None of the suggestions might prove feasible to carry out as they have been set down. Nevertheless they may lead to ideas that prove of real business building value. The real object is to work out something new along this line.

October Electrical Exports From United States

Preliminary figures for October show electrical exports from the United States continuing in volume about equal to that of the previous month. The total value, amounting to $5,123,471, compared favorably with October, 1921, when $5,371,030 worth of electrical goods were shipped.

Gains over September are noted in exports of both heavy apparatus and supply lines, although in general power-apparatus exports fell off and exports of signal and communicating appliance correspondingly increased. As compared with September, October shipments of direct-current generators over 500 kilowatts increased by $29,000, and alternating-current machines over 2,000 kilowatts gained to the extent of $141,000.

ELECTRICITY IN INDUSTRY

By Louis F. Leurey
Industrial Electrical Engineer

Marines Keep Bakery Clean Through Use of Electricity

THE accompanying photograph shows to what a splendid degree the application of electricity promotes cleanliness, light, and efficiency in the modern bakery. Many of us remember the older order of things where the smaller bakeries especially were poorly lighted and ventilated and the unhealthy conditions were reflected in the pasty appearance of many of the operators who followed this trade.

A pleasant contrast is shown in the appearance of the young "Devil Dogs" who are feeding two electric ovens in the new Marine Base at San Diego, Calif.

The baking for all the men is done at a model bakery having a capacity of 1,200 loaves per day. Flour is dumped into a giant hopper where it is sifted

Two electric ovens installed in the bakery of the United States Marine Corps base at San Diego, Calif.

to remove any possible foreign matter that it might contain. The flour then passes to the mixer where it is automatically weighed, measured, mixed and heated to the required temperature. After the dough has raised for about six hours, it is cut to the required size, kneaded and dumped into the pans by machines.

This bakery is equipped with two electric ovens, each having a capacity of 240 one-lb. loaves of bread, and consuming a maximum of 35 kw. The ovens are of the stationary type, built of brick under the supervision of the manufacturer. They are equipped with steam connections and mercurial thermometers, so that the temperature can be accurately gaged and the heating elements are above and below each deck. The whole shelf is used efficiently because of the wide doors. The three-heat control switches enable the operator to control perfectly the baking temperature. The appearance of the glazed white brick of the oven exterior is in keeping with the quality of the product of the oven. As there is no combustion, flame, fumes or soot, this type of equipment is indeed ideal for the model bakery.

Heavy Draft Horses Are For Rent at Sixteen Cents a Day

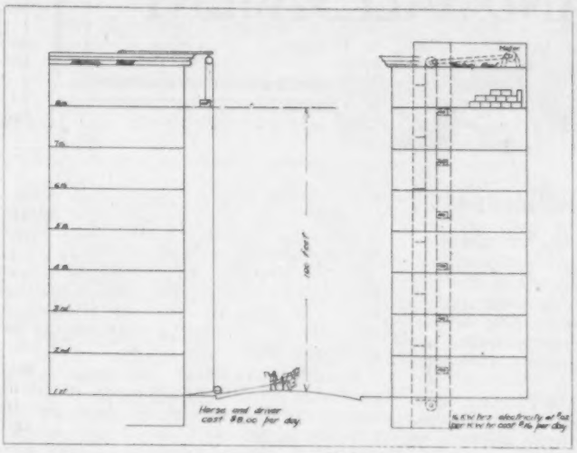
ONE of the first things the inventors of the steam engine set out to do was to find some simple and familiar measure by which the power of their newly discovered mechanical agent could be translated into every day understandable terms. They immediately began experiments with heavy English draft horses, which were at that time, the most powerful available sources for doing heavy mechanical work.

It was found that very heavy animals of this type could work at an average rate which would raise a weight of 33,000 lb. through a distance of one foot in one minute, and this rate of work, namely, 33,000 foot-pounds per minute, was called one horse power. The ordinary layman could then easily grasp the mighty power of the steam engine when told that it would do the work of twenty horses or fifty horses.

The early pioneers in the electrical industry were not so fortunate in selecting their units of measure, as in this case the units were selected purely for their scientific value and for their similarity to the general form of the metric system. While the early inventors could not possibly have foreseen this condition, their selection of units of measurement has led in modern times to a most unfortunate state of affairs under which millions of every day citizens are purchasing electricity in the form of kilowatt-hours without having any conception of the magnitude of power which they are purchasing for such a nominal sum.

The electric meter today is probably the most dependable form of measuring device in the whole commercial field, as it measures with astounding accuracy varying amounts of power from the energy of only one incandescent lamp to the output of a 100,000-kw. power plant. No commodity in commer-

cial life today, is more exact in magnitude and more accurate in measurement than the kilowatt-hour of electricity sold to the householder and to the factory, and yet there is no commodity about which so much misconception rests in the minds of the purchaser.

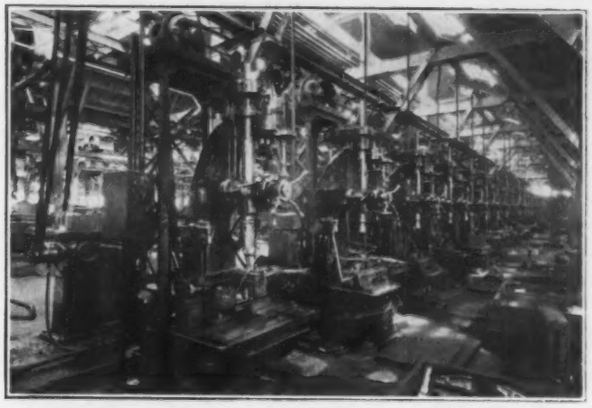


The horse and driver pictured at the left cost the factory owner about $8 a day to do the same work that the electric escalator at the right will do for $0.16 worth of electricity.

In the ordinary induction motor an input of one kilowatt into the electrical windings of the motor will produce at the pulley, the power to do a horsepower of work. If this energy is employed continuously in the motor for a period of one hour it will then represent to the purchaser the amount of energy equal to one kilowatt-hour for which he pays approximately two cents and which does for him during that hour an amount of physical work which could only be equaled by that of a very heavy draft horse.

As an illustration, let us suppose that a manufacturer had a number of 100-lb. bales of goods to lift to his eighth floor which is 100 ft. above the street level. A very heavy draft horse working to his full capacity could lift 200 of these bales per hour, or 1,600 in an eight-hour day, at a cost which would probably not be under $8 per day for the rent of the horse and wages of the driver. This same exact amount of work, lifting these 1,600 bales, could be done with an electrical motor using one kilowatt each hour of the eight at the total cost to the manufacturer of sixteen cents for a day.

It is probably not an exaggeration to say that by far the greatest majority of complaints which reach the public utility companies come from this misconception of the physical magnitude of work that is done by a kilowatt-hour. An organized effort on their part to interpret this kilowatt in terms of familiar things will go a long way toward popularizing the still greater use of electric energy.



This photograph, taken in the plant of the Holt Manufacturing Company, Stockton, Calif., shows the great advantage which can be obtained in the arrangement of equipment in the modern machine shop by the use of individual drive. The motors occupy no floor space and the control equipment is directly under the operator's hand, permitting the fullest utilization of floor space and the quickest control possible of the motive equipment. Under the very latest practice, a still further step is taken and the compensator is made automatic so that only a push button at the machine tool is required to stop and start the motive equipment.

Electrically Lifting the Black Gold

SINCE 1859, when the first oil well was drilled in Pennsylvania, the main object has been to expedite oil production without much regard to efficiency. Now, however, while the object may be the same, the cost of doing so is being given considerable consideration by oil men. Near Fullerton, Calif., there is a special case which is worthy of note and is a case in point where in actual practice it has been proven that electric service is superior and cheaper. This well was first pumped by steam and was very expensive and inefficient. It was changed to electric drive with Westinghouse 15-35-hp., two-speed variable speed motor of the wound rotor type. The speed of the 15-hp. rating is 479 r.p.m. and the 35-hp. rating 965 r.p.m.

This motor will not stall on overloads many times its normal rating and is built with rugged frame and heavy bed-plate to insure service and stability. The motor is connected with a 5 to 1 turbo-reduction gear, and uses the flywheel on the shaft and a weight on the beam for a counterweight. The new installation pumps 70 bbl. of 16 gravity oil a day, an increase of 20 bbl. per day, and operates at less cost than the system formerly in use.

The total weight which the pump has to pull is 32,700 lb., of which the weight of the oil pumped is only a small part. The oil is raised 4,450 ft. at a rate of 70 to 75 ft. per minute. Three lines are operated by the motor and the pumping speed is increased in this way instead of decreased as is the case with the steam engine. This is due to the fact that the last stands are pulled faster than the first by the electric motor, while the steam engine speed is reduced as the last stands are reached because of the falling-off of steam pressure under heavy pulls.

Any pump man is able to look after a field of twice as many motors on pumping wells as is possible where gas or steam engines are used. The increased efficiency of the electric motor will undoubtedly lead to further installations in the oil fields of California and other states where electric power is readily available.

JOBBER, DEALER AND SALES AGENT

Are You Conducting Your Business Efficiently?

Questionnaire Gives Contractor-Dealer Opportunity to Estimate True Value of Business Methods Followed

Now that the books of the electrical contractor-dealer have been closed for the year 1922 and the attention of the men in the entire industry is turned to 1923, plans for increasing business are foremost in the minds of everyone. Business alone is not what the contractor-dealer is after, but rather business which he can get at a profit and which will lead to more sales to the same customers.

For the wide-awake and enterprising contractor-dealer who is endeavoring to make business better for himself and for the industry in general, the working day starts when he awakens in the morning and often lasts until hours after he has gone to bed at night. The hours spent in the place of business conducted by the merchandiser may be only eight or ten but the brain work which he must perform can not be limited to any definite length of time.

Principles under which the business is to be conducted can not always be definitely formulated during the hours that the head of the firm spends in his office. Plans for new sales campaigns to be entered upon are most often prepared after the contractor-dealer has come home at night, after the day's work at his store.

To the members of the Electric Service League of British Columbia, who are prepared to spend a little extra time in the evening, looking after the interests of their business, Rey E. Chatfield, secretary-manager of the league, addressed a questionnaire, which is designed to aid the contractor-dealer in bringing his store up to its proper efficiency. The questionnaire was sent out in the form of a bulletin and was prepared to be used by contractor-dealers of the league for their own satisfaction only.

In announcing the purpose of the questionnaire, it is claimed that the winter months are the slackest of the year and are therefore good months in which to look back over the past year and to arrange to correct the mistakes which occurred during the last twelve months. The bulletin is really a grading chart with which the contractor-dealer can, if he will, honestly grade himself in relation to what is considered as one hundred per cent efficiency.

To the electrical merchandiser, who is honest with himself and who is willing to try to give his store an absolutely fair rating, the grading chart should be of considerable value.

Countless business barometers are published for the business man of today, but no man outside of the firm, who is not conversant with the actual operation of it, can be expected to give any definite statement as to the efficiency of management that prevails in that concern. The man who is willing to admit his mistakes and to profit by them will gain in the end. Mistakes are made in the management of every business and will continue to be made. One of the biggest problems confronting the manager of any concern is to discover these mistakes and then try to eliminate them.

The grading system prepared by the Electrical Service League of British Columbia is designed to aid just such managers who are anxious to remove the mistakes of yesterday. Inefficient management will not be corrected unless the men responsible are ready to search the records of last year looking for blunders that occurred then.

The electrical contractor-dealer may spend eighteen to twenty hours a day worrying over his problems and if he does not seek to correct his past errors, he will be in the same position as the man who kept pouring wine into the barrel at the bung-hole, but failed to turn off the tap.

The grading scheme which Mr. Chatfield prepared gives 100 per cent for a perfect grade. The perfect grade figures appear at the left hand side of the list and at the right is left a space for the contractor-dealer to enter his estimate of his grade.

Perfect Grade		Your Grade
6	Have you an up-to-date accounting system in your business?	.....
5	Is your business growing?	.....
6	Do you take an annual inventory or maintain a perpetual inventory?	.....
5	Do you figure selling price so as in all cases to guarantee you a profit?	.....
5	Can you state definitely in percentage what your overhead expense amounts to?	.....
5	Have your sales reached a maximum for the expense involved in selling?	.....
3	Do you know what lines pay best and which pay least?	.....
3	Is your advertising planned carefully ahead?	.....
3	Do you push nationally advertised goods?	.....
5	Do you discount your bills?	.....
3	Do you make a special effort to sell the more profitable articles?	.....
6	*Do you turn your stock at least 4 times a year? (Allow 1 for 1 turn; 2 for 2 turns; 4 for 3 turns; 6 for 4 turns; 8 for 5 turns and 10 for 6 turns.)	.....
2	Do you meet your customers personally?	.....
5	Do you buy from more sources than necessary?	.....
4	†Are your windows regularly trimmed and attractively trimmed?	.....
5	Do you give prompt and courteous service?	.....
4	Do you and your clerks study the merchandise you sell?	.....
2	Do you know how it is made and its best talking points?	.....
3	Do you make use of manufacturers' free advertising cuts and other helps?	.....
3	Do you belong to the Contractor-Dealers' Association?	.....
6	Do you attend the meetings?	.....
3	Do you read at least 3 good trade journals? (Allow 1 for each)	.....
2	Have you a good mailing list?	.....
3	Do you use it?	.....
3	Do you have cooperation and teamwork in your business?	.....
Total 100%		Your Grade .....%

Question marked † does not apply to contractors, but additional credit for increased turnover in question marked * makes up the difference.

An Association I Know

By JOE OSIER

Despite the fact that I know that I am laying myself as wide open as a barn door and —

That I may be accused of heresy or convicted for alleged perjury, I intend, in this column, to dilate at length—

As long as the dilating is good, on the subject of "An Association I Know."

It is not my intention, wittingly, to park on any association's or association member's bunions, but, if I do—I shall write another column apologizing—i.e.,—

Providing I can peddle it.

"But, anyway," as the garrulous ol' girl remarked to another g.o.g. over the back fence—

I know an association whose membership is loyal; loyal to the association and one to another;

Where there is no knocking and where the "beefing," differences of opinion and rag chewing is turned to some good account;

Where the members boost each others' business and their mutual interests, generally; and—

Where perfect harmony exists after the hair, teeth and ears have been swept into the corner and the battle definitely ended.

I know an association where every member (not paralyzed or in jail) attends every meeting and—

Where every member sometime during the proceedings lifts his voice—hurls his broadside—says his say, and tells those in attendance specifically, and the world, generally, that he is not—

Painted on a chair.

In this association there are no "yessirs" and—

Let George Do Its.

They are all Georges and they pack convincing wallops in either hand or head and—

They seldom, if ever, speak out of turn.

In this particular association, the members pay their dues—in regular money, without grumbling or plaint and—

Special assessments, for worthy purposes, are the things they are fondest of.

Time after time, I have known of this association, as a whole, galloping immediately to the rescue of a needy brother member who had run afoul of John Trouble. I have seen them dig down deep and come up with their hands full of ducats which they gladly proffered to the Buddy who was—

Gettin' his'n.

This association did all this and adjourned, forgetting all about the resolution of sympathy which we all know will not buy—

Pork at present prices.

But, best of all, this association's membership "gets together" on the essentials and the big ideas. When the proposition is right, it carries, and this factor, above all others, I think, explains why the association amounts to something.

Now the above expressed truths may fit your particular association. I hope they do. However, if they do not—

Why don't they?

Electrical Company Conducts Educational Week

Southern California Company Demonstrates that Company Acting Alone Can Present Special Week with Success

Thinking men of the electrical industry, have acknowledged the fact that the industry is still in its infancy and that it is necessary to educate the public in the use of electrical devices. To make a man change his ways, requires time and patience. This is true regardless of the fact that an effort is being made to make life easier and more convenient for him.

Magazine, newspaper, and direct-by-mail advertising must be resorted to and in addition actual demonstrations of the "way it works" must be presented to the man whose ideas are to be changed. One of the most successful means of providing this information to the public has been the "Electrical Week."

Various incidents of special sales campaigns, in which weeks have been set aside to feature certain articles, have been noticed where cooperative action on the part of electrical dealers has made these "Electrical Weeks" possible and profitable. In most cases, a great deal of time has been spent in mapping out the campaign and it has been necessary for quite a considerable number of dealers to work together to make the week a success.

Cases where special weeks have been arranged for and conducted by only one firm are fairly obscure. The general conception of the special week campaign has mitigated against the use of this selling campaign by the electrical dealer unless aided by other men in the industry.

The advantageous publicity and the educational features of the special weeks are the principal things to recommend them. Cooperative advertising prior to the actual opening of the special displays, has in the past, done a great deal to spread the electrical idea and the success of the idea, when supported by a number of electrical dealers, has been proven.

The actual demonstrations to persons interested have always been conducted in the stores of the individual dealers. During the week these men have all featured what was being advertised and in this way tied in with each other in the educational campaign.

Considering these points, the Southern Electrical Company of San Diego, Calif., decided to conduct a special Radio Week alone. The company realized that radio equipment needs more introduction than does the general electrical idea, because of the even later entering of this class of equipment into the markets of the world.

In the campaign conducted by the San Diego dealer, everyone who attended the store was treated as a visitor. The purpose of the week was to educate the people of the California city in the principles of radio and to inform them as to the benefits that they could receive from it. Every afternoon and evening demonstrations were given, showing different classes of equipment in operation. Salesmen were present to explain the operation of the different types of receiving sets.

No attempt to force sales was made during the week. The entire purpose of the firm was to make the people better acquainted with the usefulness of the equipment which they saw in operation at the store. In spite of this a marked increase in radio business was noticed immediately after the week.

The announcement of the Radio Week was made the Sunday prior to the time of starting the demonstrations. Half-pages of display advertising copy were run in the three daily papers, and these announced the time, location and purposes of the special week. Smaller copy followed these preliminary announcements and three-sheet poster boards in various parts of the city were used to reach other people who might have missed the newspaper advertisements. Employees of the company were supplied with banners announcing the week, and these banners were prominently displayed on their automobiles

The idea was a success, according to the company and Eugene P. Merritt, manager of the concern's radio department, thinks that the Radio Week was in a great measure responsible for the large radio business done by the firm during the Christmas buying period. The advertising costs were the principal ones incurred during the week and these were easily made up for by the larger business resulting from the demonstrations.

Southern Electrical Co.
RADIO WEEK
A Week for Radio 'Fans'
An Entire Week Devoted to the Instruction and Education
If Everyone Is Now or expects to be Interested in Radio
Radio
Demonstrations Every Afternoon Daily Every Evening
For You
For Your Instruction
We are exhibiting this week the newest in Radio Sets and Radio Equipment.
Southern Electrical Co
Demonstrations Given
Afternoons and Evenings at our 3rd and E St. Store
Everyone Welcome

Three San Diego Sunday papers carried this half-page advertisement announcing Radio Week.

Every Dealer Can Trim His Own Windows

No window artist was employed to make the setting for the "Cozy Glow Boy" for the Chico Electric Supply Company, shown below.

Carefully planned windows in a jobbers place of business are an inspiration to retailers. The Electric Railway and Manufacturers Supply Company of San Francisco window is shown above.

Small motors were used as a basis for the window in the store of Thomas Day Company in Oakland, shown on the right.

With Service Prepared by Manufacturer

A small corner window presents no difficulties to W. S. Cass of the Chico Electric Supply Company as the window below shows.

Two rooms of an electric home were set up in the window of the Buford Company, Inc., at Fresno, by Stuart Roger, who decorated the window pictured above.

The material furnished by the manufacturer was used as the basis for the simple display in the window of the Electric Railway & Manufacturer's Supply Company of San Francisco shown at the right.

Sell the Woman Buyer the Goods — Not the Price

A Woman's Reaction to the Sales Talk Employed in the Store of the Modern Dealer in Electrical Appliances

By "PRUDENCE PENNY"

When Mr. Editor asked me to write a story for the Journal of Electricity and Western Industry I said, "Oh, dear, I don't know anything to interest the dealers. My work lies with the women, the home makers, and all I know about your people is that I wish some of them would take lessons in real salesmanship."

"That's just what we want," he answered. "Supposing you tell us something about the woman's point of view."

Now, I contend that salesmanship is a great and uncharted sea from the average woman's viewpoint. She does not understand it; in fact, she does not need to do so, but she is keenly interested in the fact that she is purchasing, and that she is the one to make the money go farthest.

I happened in an electrical store not long ago where a clerk had just commenced to show a woman some irons. He showed her the most expensive ones first. After she had compared them in her own mind she ventured with, "What is the real difference in these irons?"

"A dollar and a half, m a d a m," urbanely answered the clerk.

"Oh, yes, of course, I know that. What makes the difference? Which points are better, or what causes the difference, maybe I should have said."

Do you know what that man answered? "Well, one is better than the other."

It interested me to see that he lost his sale completely, yet I am convinced that if he had explained to her that the heating element of the more expensive iron was better, that the construction was more perfect, that the materials were just a bit better, he would have sold the best iron in stock.

Women do not buy as they used to. They are seeking value for their money. They ask more, "How will this stand up under the work, how will it DO MY WORK?" rather than the price, and it is a step in advance of our older ideas.

Now I grant you, I could not sell merchandise behind a counter, but I wager I know more about the average electrical appliance sold in the retail stores of today than do the majority of the clerks, because I take the trouble to find out. When a woman writes to me to ask about a certain electrical appliance I must not only know the price, but the construction, the methods of use. Consequently I am better fitted to sell than the very men who handle the goods.

This is not a criticism upon any man or firm, it is rather upon the methods and the lack of cooperative educational work among the salesmen. There are some shops which are looking to this important work, but many more are not, and the average woman does not understand electricity.

She is afraid of most of the appliances. She feels it is more trouble to use the new inventions than it is to keep on with the old-time devices, hence not only must her interest be aroused, but that subjective little fear removed from her consciousness, and of this I am absolutely certain.

Women must be taught to use and understand the various appliances, not alone from the labor-saving standpoint, but from the standpoint of conserving their energy. They must be shown the ease with which such appliances can be attached and detached, and if a woman has an old-fashioned home, too much stress cannot be made upon the convenience outlet and the fact that old homes can be modernized.

I have listened to men telling women about a washing machine, how it is beautifully enameled, how it is encased in a wonderful cabinet, how the gears are such and so, how the cylinder or oscillating tub or vacuum plunger is that and this, and never once do they tell her the time it will save. The facts that the clothes will wear longer washed in a good washing machine, that her time is of value and that she can count it in terms of gain when she conserves it, do not seem to be a part of the sales talk of the average salesman.

It is the same way with lighting fixtures.

The majority of women purchase those which appeal from an artistic sense. The salesman should have an interest in the psychology of light, how it affects not only the dispositions of the inmates of the home, but also how poor light is a detriment in more ways than one. If a woman learns that she can have a pretty light, yet one that is serviceable and will give the best possible effect for the health and comfort of all concerned, she will naturally purchase it even though it be a bit more expensive.

That is why I feel that dealers should have regularly trained salespeople. The man who sells an electric heating pad should know the value of applied heat to relieve localized pain, and not merely sell something to a woman because it will be a warmer. Hot water bottles can do the same thing, you know.

And once again, I am not a salesperson. I am a purchaser, I do know the great value of electrical appliances, and I am more than hoping that the time will come when every woman of us will use electricity for as much of our homemaking as is possible, for I firmly believe in it.

Through cooperation with real estate agents, the architect, builder and the lumber company, the Western Light & Power Company and the Hinde Electric Company of Loveland, Colo., are planning to exhibit an electric home in the small Colorado city. No definite date for opening the exhibit has been set as yet.

Show the woman customer the things that the appliance will do to save her time and work, instead of just telling her that one iron is "worth" more than a lower priced one

An example of the way that the electrical dealer may attract the radio-enthusiast into his store and pave the way for future sales of other electrical appliances

Radio as a Sales Aid to the Electrical Merchant

Dealers Who Handle Radio Equipment Have Many Opportunities to Secure Other Business from the Same Customers

By F. W. CHRISTIAN

There is still some little doubt in a few electrical dealers' minds as to the advisability of carrying a radio stock. This is principally because during the spring they saw a comparatively insignificant item—Radio—spring to the front and become a tremendous business. Then, during the summer months, when people were vacationing, and when it was too hot to stay indoors, the demand fell off and there appeared to be a big slump.

With the coming of the cold weather, the popular interest has revived and the radio sales are again on the upward trend, increasing by leaps and bounds —each day better than the day before. Broadcasting has improved wonderfully in the past month. Several Class B stations have gone into operation. These stations must put on good programs, and also must maintain good modulation. The penalty for failure to do these things is the loss of their license.

Naturally these stations are helping the radio game. B. R. Hassler of the Colin B. Kennedy Company, of San Francisco, on a recent visit to Los Angeles, informed the writer that people in Northern California, who had given up in disgust, had brought out and dusted off their sets, to listen to KHJ—the Los Angeles Times. This is the only Class B station in operation on the western coast at the date of this writing, but others will soon be ready, increasing the interest just as KHJ has done and is doing.

Now, electrical dealers, it is advisable for you to carry a radio stock. You are very much behind the times if you haven't radio. While in an electrical store, making some purchases about a year ago, the writer witnessed an interesting incident. A well-dressed elderly man asked the clerk for a detector tube and was informed that that establishment did not carry radio. This man was purchasing agent for a large office building. The electrical store, by not having radio, probably lost hundreds of dollars in future electrical business.

Radio brings all sorts of people to your store—doctors, lawyers, engineers, political men, ministers; in short, men of all professions are interested in radio. Radio is the greatest little friend maker you ever saw. Every satisfied radio customer becomes the dealer's friend. He will purchase everything in the electrical line that he needs from his radio dealer. More than that, he will bring his friends to your store to hear the radio or to show them a certain piece of apparatus. A good radio friend means a good customer and a good customer means more good customers and many purchases.

The writer recalls a man, one of his radio customers, who just recently bought a Royal vacuum cleaner of him. Another man has purchased two large tailor irons, another a heater, another a desk lamp and so on ad infinitum.

Many electrical items may be sold for use with the radio set. Among these may be numbered desk lamps and table portables, fans for summer and heaters for winter, wiring devices such as double sockets, attachment plugs, etc. The dealer will find it a very good plan to keep a mailing list of his radio customers, so far as possible, and circularize them or have the salesman call on them. Many electrical appliances may be sold in this manner.

An attractively dressed radio window, combining certain appliances such as heaters and lamps, will do much to help along. People will stop to look, get an idea and ofttimes come in to buy. Others, passing by, will remember the place and return at a future date. By using good salesmanship and the power of suggestion, many good sales may be made. For instance, in selling a radio man a heater, just mention the fact that by hanging the ear-phones down in the center of the reflector, an excellent loud speaker may be had.

The radio business for the future is bound to be good. There are so many good uses for a radio set. The farmer may now receive market and weather reports and news of the city long before his paper arrives through the mail. Get his radio business and you will also have his electrical business.

People need no longer crowd the streets until all hours of the night for election returns, but may sit comfortably at home and get them by radio before they are put on the bulletin boards. These news, election and sport reports alone will cause a great demand for radio sets.

Many churches are broadcasting sermons and members of their congregations will wish to buy receiving sets—more prospective washing machine and vacuum cleaner customers—for we all know how gossip spreads in a church congregation! One satisfied customer tells another member about you, she tells another, and so your store is advertised. Isn't it true?

Radio is here to stay and the radio business belongs to the electrical and radio men. Department stores, drug stores, garages, etc., are gradually dropping out. The music stores seem to think that because radio may be used as a means of musical entertainment, the business belongs to them. How can this be true? What will they do when the customers' batteries go bad and need repairs, or when a tube burns out and the customer wants to know why. Will they be able to properly erect antennas and to advise as to hooking up the set? No—this business belongs to the electrical industry, where it was fostered and developed, and there it will remain.

During the Christmas season just past radio equipment was in demand everywhere. To those dealers who were ready to offer radio to gift-hunters, it proved a great aid. But the time to profit from this trade-getter has not passed entirely. Extra parts will be needed by amateur radio enthusiasts, if you present these parts to them in a logical sales-producing manner. The boy or man who has received an outfit for a Christmas present is a wonderful prospect for any electrical dealer. There are many attachments and small devices that will improve the receiving abilities of any set and that can be sold to the radio owner at a good profit.

The electrical dealer who is ready to reap the benefits from this trade will have the jump on his competitor who is not ready to advance with the industry. The good will that may be obtained from the buyers of radio equipment, when you have served them well, will again add to the totals which you will be able to notice on the right side of the profit and loss account at the end of the year.

INDUSTRIAL NEWS

Four Members Named for State Railroad Commission

Just prior to his retirement from the office of governor of California, Governor William D. Stephens appointed four members to the California Railroad Commission. Terms of the men appointed range from two to six years.

Clyde L. Seavey, city manager of Sacramento, was appointed to succeed H. Stanley Benedict, of Los Angeles, whose term expired Jan. 1. Mr. Seavey was formerly a member of the state board of control and a strong supporter of the proposed Water and Power Act and the King Tax Bill. He will hold office for six years.

Harvey W. Brundige, the president of the commission, was appointed to fill the unexpired term of Harvey D. Loveland, who died about six months ago. This appointment gives Mr. Brundige a term of four years.

The vacancy on the commission caused by the resignation of Chester H. Rowell is to be filled by Edgerton Shore, who, before his appointment to the Railroad Commission, was a member of the state board of control. Prior to his service on the state board of control Mr. Shore was a member of the board of education of Los Angeles.

James T. Whittlesey, a constructing and consulting engineer of San Francisco, will hold office for two years. He takes the place vacated by Mr. Brundige. The manipulation of offices gives Mr. Brundige the four-year term and Mr. Whittlesey, the only engineer, receives the two-year term.

The failure of Governor Stephens to reappoint Mr. Benedict and his appointment of Mr. Whittlesey were the only real surprises of the announcement.

Canadian Company to Construct New High Tension Line

The building of a new high tension line from the Lake Buntzen plants to Vancouver and the reconstruction of the Barnet crossing over Burrard Inlet will be undertaken by the British Columbia Railway Company immediately at a cost of $172,000.

The present lines and crossing have been in use since 1903. The new line will avoid the water crossing by way of the head of Burrard Inlet. From a point on the present high tension right-of-way to Port Moody a new 34,600-volt line with a single circuit six miles long will be constructed. From Port Moody to Barnet the present line will be reconstructed and relocated, new insulators being used. This section will be five miles long. Copper 3/0 wire will be used for the conductors. Two telephone circuits will be provided. This part of the work will cost $82,000.

The Barnet crossing is 2854 ft. from tower to tower and at present has only 125-ft. clearance above high water. By replacing the north tower with one of steel, a clearance of 160 ft. will be provided.

The four circuits now on the towers are of half-inch steel cable, but these will be replaced with three heavier circuits of aluminum or copper. This work will cost $90,000. Work on the new high tension line will begin at once, and as soon as it is completed the crossing will be reconstructed.

Permit Given for Diamond Creek Power Development Dam

A permit for the construction of a $40,000,000 power dam has been granted to James B. Girand, an engineer of Phoenix, Ariz., by W. S. Norveil, state water commissioner of Arizona. The dam is to be constructed on the Colorado River at the mouth of Diamond Creek, twenty-six miles above Peach Springs, Ariz., and approximately one hundred miles above the site of the proposed Boulder Canyon dam. The Diamond Creek project is to generate 200,000 hp.

An application for a permit for construction and operation from the Federal Power Commission is now pending. Two years ago a permit for the site was granted to Mr. Girand and an agreement was made with the commission, the terms of which provided that when certain development work was completed the commission would grant a license for operation. The development work has now been finished.

The permit in no way conflicts with the provisions of the Colorado River compact recently signed at Santa Fe, N. M., according to State Water Commissioner Norveil.

An assignment of the permit granted by the State of Arizona has already been made to the Colorado River Engineering & Development Company by Mr. Girand. This Arizona corporation will endeavor to start construction on the project the latter part of the month.

Work on the 110,000-volt transmission line of the Puget Sound Power & Light Company, extending from the company's White River hydroelectric plant in King County to the city of Wenatchee is progressing rapidly. The entire 120 miles of right-of-way, crossing two mountain ranges, is cleared and fully one-fourth of the wooden poles and steel towers are up, the steel being used at the higher elevations. This line is expected to pick up a large pumping load from the irrigated section around Wenatchee, Wash.

Puget Sound Co. Purchases Nine Washington Utility Plants

The largest transaction in municipal utilities recorded in the history of the State of Washington was consummated recently when the Puget Sound Power & Light Company, Seattle, a subsidiary of the Stone & Webster Corporation, purchased from the Washington Coast Utilities the light, power, gas, waterworks and ice plants in nine separate towns and communities in the Puget Sound district and in Eastern Washington.

The purchase included: Wenatchee light, power and gas plants; Vashon Island electric light, power and telephone systems; Arlington light and power systems; Edmonds light and power systems; Stanwood light and power system; Elma light and power systems; Montesano light and power systems; Port Townsend light, power, gas and ice plants; South Bend water works.

Acquisition of these various public utilities in a lump was made more readily possible by the fact that they were all previously gathered together by the Washington Coast Utilities, a corporation headed by F. D. Nims. The Washington Coast Utilities maintained head offices in the New York Block, Seattle, and the affairs of the combined companies will, for the time being, be carried on from the New York Block headquarters. Eventually they will be consolidated in the offices of the Puget Sound Power & Light Company in the Electric Building.

The new manager of the utilities purchased will be R. U. Muffley, former superintendent at Bellingham of the Puget Sound Power & Light Company.

The affairs of the companies purchased will be directed by the same official board which administers the affairs of the Puget Sound Power & Light Company, namely: A. W. Leonard, president; W. H. McGrath, vice-president; F. H. Brownell, treasurer, and James B. Howe, secretary.

Fire Damages Southern California Edison Co. Substation

Fire, which threatened to destroy the entire structure of the Eagle Rock substation of the Southern California Edison Company near Los Angeles, burned for eight hours on the night of Jan. 8, causing damage variously estimated between $100,000 and $250,000. The fire was caused by an explosion of a 60,000-volt lightning arrester. In addition to the large number of switches and transformers destroyed or damaged by the flames, 160,000 gal. of transformer oil stored in the substation was burned.

Record Submarine Power Cable Laid in San Francisco Bay

The Great Western Power Company, of San Francisco, on Jan. 8, completed the laying of the longest and largest submarine power cable ever installed. The cable is over seven miles long and reaches across San Francisco Bay from the south end of Brooks Island to pier 41 in San Francisco. The cost to the company was approximately $500,000.

The method of laying the cable is entirely new for power cable laying work. The actual time consumed in laying the 38,500 ft. of cable was two hours and thirty-seven minutes. Before the cable was laid the men in charge thought that it would require at least seven or eight hours to do the work and the record set was a surprise to them. Three tugs pulled the barge which carried the cable and progressed at a rate of over three miles an hour.

The cable is an 11,000-volt three conductor, 500,000-cir. mil. cable capable of transmitting 10,000 kw. It was laid to enable the power company to bring additional hydroelectric power into San Francisco and in this way make possible a reduction in the steam generation of the company.

Because of the unusual length of the cable it was shipped from the factory of the American Steel & Wire Company coiled on gondola freight cars instead of on reels. Four thousand eight hundred-ft. lengths were placed on each car and nine of the largest gondola cars available were used in bringing the cable west.

In laying the cable the entire length of 38,500 ft. was coiled in circular pancake-like coils on a special cable-laying barge. All splices were made before the cable was coiled on the barge and the laying of the cable was one continuous process.

In feeding the cable off of the barge no manual labor was required. Because of the way in which the cable was coiled, it fed off of the barge by its own weight and the tugs pulling the barge advanced the barge as the cable sank into the bay.

The method employed in laying the cable was the same as has been used in laying long trans-oceanic cables, but this is the first time that a long submarine power cable has been installed in this way. The splicing and laying of the cable was performed under the supervision of A. O. Hoeftmann and J. J. Morrison, factory representatives of the American Steel & Wire Company.

Fifty-five Street Cars Ordered by Oakland Traction Company

Fifty-five double-truck electric street cars have recently been ordered from the American Car Company by the San Francisco-Oakland Terminal Railways Company, of Oakland, Calif. The cars will cost, delivered, approximately $808,500. Delivery is to be made within five months.

The cars are to be made for one or two-man operation and will be so designed that they can be operated in two-car trains with three men. The cars will be 44 ft. 10 in. long over all and will be of steel construction.

General Electric Company and Westinghouse Electric & Manufacturing Company motors will be used to give the cars four 40-hp. motors. General Electric Company multiple unit control and air compressors are to be installed by the car builders. Brill trucks will support the 35,000-lb. cars.

To facilitate operation in two-car trains, automatic couplers for both air and electrical connections have been ordered. Doors and folding steps on both sides of platforms will be pneumatically operated and will be connected with the usual safety devices on the one-man cars.

Pacific Gas & Electric Company and Western States Gas & Electric Company have been authorized by the California Railroad Commission to transfer to each other certain electric distribution properties near Stockton and Lodi, Calif., that they may eliminate duplication of systems. The properties to be transferred to the Western States were valued at $104,221, while the properties to be acquired by the Pacific Company aggregate $42,695. The companies are directed to submit to the commission a method of settlement with consumers for deposits made for extensions or guarantee of bills.

Construction work has started on a 17-mile electric logging road extending up the Santiam River to White City at Upper Soda Springs, Calif. A. A. White of Portland is promoting the enterprise.

Barge laying Great Western Power Company cable across San Francisco Bay

Design Transformer to Prevent Fire and Explosion

A transformer using entirely new principles of construction has recently been designed by Walter M. Dann, an engineer of the Westinghouse Electric & Manufacturing Company. The new transformer is said to be so constructed that the danger of its exploding or catching fire is entirely removed.

The chief principle of the new design is the layer of nitrogen gas which is kept over the oil in the transformer. Nitrogen is an inert gas and will not support combustion, so that danger of fire in this way is removed. Should a short circuit occur in the transformer, causing a violent pressure below the oil level within it, the nitrogen is readily compressible and will act as a buffer. Thus no extreme pressure will be exerted upon the walls of the transformer.

The amount of gas in the transformer is kept constant by an automatic device which is attached to the transformer. The nitrogen will also keep the oil from deteriorating and will prevent the entrance of moisture.

New Valuation Placed on Idaho Company by Commission

As a result of a hearing recently completed before the Public Utilities Commission of the State of Idaho, a valuation of $11,638,459.60 for the properties of the Idaho Power Company has been set as a fair amount for the date of Dec. 31, 1919. From this sum the commission has ordered that 13.25 per cent be deducted to allow for property owned but not fully useful and not entitled to a full return.

To the balance obtained after making the deduction ordered, must be added the value of additions and improvements during the years 1920 to 1922, inclusive.

In announcing the base of 1919, the commission has ordered that a hearing be conducted to bring the valuation down to date and to fix rates which shall be charged by the power company. The hearing has been scheduled for Jan. 22. At the time stipulated, rules, regulations and forms of accounts for the accumulation, protection and expenditure of depreciation funds will also be made for the company.

The Shevlin-Hixon Lumber Company of Bend, Ore., has contracted with the General Electric Company to furnish a 1,500-kva. synchronous condenser. The lumber company has several thousand horsepower of induction motor load and more generating capacity was needed. It was found that by using a synchronous condenser to supply magnetizing current, the generators were available for supplying energy current. This scheme worked out cheaper than buying generating equipment of the same capacity. As far as is known, this is the first synchronous condenser to be used in a sawmill in the northwest.

The index to Volume 49 of the Journal of Electricity and Western Industry has been printed and is ready for distribution to subscribers. The index may be secured by addressing the Circulation Department of the Journal of Electricity and Western Industry, 531 Rialto Building, San Francisco, Calif.

Pacific Gas & Electric Company Given New Rate Base

Holding to its decision that the historical reproduction cost basis is a correct one for controlling the establishment of power rates, the California Railroad Commission has recently set the rate basis of the Pacific Gas & Electric Company at $109,723,695. This new valuation will reduce the rates of the company about 12 per cent and will bring about an annual saving to customers of the company of about $2,500,000. The rates are designed to give the company a return of 8 per cent on the commission's findings of reasonable investment.

Industrial power rates in general are reduced 10 per cent and a uniform schedule is made applicable all over the system. Agricultural schedules are modified, and where schedules have overlapped this discrepancy has been eliminated.

A special discount in rates was ordered to be made to resale companies to assist in developing rural territory served by these resale companies. The company has also been directed to purchase transformers from consumers taking reclamation service and to make extensions over private property where public highways are not reasonably available. The wholesale power schedule has been modified to give lower rates to consumers operating at high load factors.

The new lighting rates will go into effect Feb. 1 on flat rates and will obtain after Feb. 20 where meters are used. The new schedule for the San Francisco Bay region is as follows:

First 40 kw-hr. or less per meter per month, $0.90 per month.
Next 40 kw-hr. per meter per month, $0.06 per kw-hr.
Next 150 kw-hr. per meter per month, $0.05 per kw-hr.
Next 800 kw-hr. per meter per month, $0.04 per kw-hr.
Next 2,000 kw-hr. per meter per month, $0.03 per kw-hr.
Over 3,000 kw-hr. per meter per month, $0.02½ per kw-hr.

Local Utilities to Be Taxed by Utah County Assessors

As the result of a recent decision handed down by the Supreme Court of Utah, the right of county assessors in that state to levy and collect assessments on public utility companies having no physical inter-county connections has been upheld. For several years past all public utilities in the state have been assessed by the state board of equalization regardless of inter-county connections.

During the past summer the question was submitted to Attorney General Harvey H. Cluff, who held that assessment of such properties was a purely local affair. On his advice the state board removed its assessment from the Telluride Power Company and the Garfield County assessor made the levy on the property. The case which has just been decided, was instigated against the county assessor of Garfield County by the power company.

Three new transformers of large capacity are being installed by the Idaho Power Company at its American Falls plant. The transformers will take care of any increase in power that may come from the plant and will aid in the handling of the present output of the plant.

Complete Oregon Hydroelectric Power Plant by March

Work on the 10,000-hp. hydroelectric plant of the Pacific Power & Light Company on the Hood River is rapidly nearing completion. About 150 men are now employed on the laying of a pipeline which will be about two and one-half miles long.

The new power plant will be connected with the plant of the Northwestern Electric Company on the White Salmon River, in Klickitat County, Wash., by way of a transmission line suspended over the Columbia River. The plant, according to the Phoenix Utility Company, the builders, will be completed by March and will cost in the neighborhood of $1,250,000.

There are available several bound volumes of the Journal of Electricity, Power and Gas which cover the period from Jan. 25, 1913, to Dec. 31, 1917. The issues comprise Volume XXX, No. 4, to Volume XXXIX, inclusive. The issue of May 27, 1916, Volume XXXVI, No. 22, is missing. Information concerning these volumes can be secured from the Editorial Department of the Journal of Electricity and Western Industry.

Denver Celebrates Completion of Street Lighting System

A carnival celebrating the installation of an ornamental street lighting system was held on Santa Fe Drive in Denver Dec. 15-16, at which city officials, merchants, and residents of the west side in that city participated. According to reports, it was one of the most successful community celebrations ever staged in Colorado, and its success, it is said, was due in no small part to the assistance given by the electrical industry.

The Santa Fe Drive Commercial Association financed the street lighting system, while the paving was done by the city for the property owners of the district. It is the first step in improving that section of Denver, according to the speech of acceptance made by Mayor D. C. Bailey, which will lead to the completion of the project and further improvements along the entire driveway to Overland Park, the municipal camping grounds.

The lighting standards were supplied by the Mountain States Machinery Company and the units by the General Electric Company. E. E. Stettler, a prominent west Denver electragist, was a member of the committee which financed the project. A radio concert was broadcasted at his store during the carnival with loud-speaking apparatus provided by the Western Electric Company. The radio program itself was arranged by the Electrical Cooperative League of Denver.

Idaho Farm Users of Electricity Are to Receive Rebate

Complying with a special act of the last legislature, the Idaho public utilities commission has issued an order granting a rebate to all irrigation farmers in the state using electricity for pumping. The total rebate ordered by the commission amounted to $47,232.87, divided among four power companies supplying current for irrigation purposes in the state during the 1922 irrigation season.

The law passed by the last legislature exempts all power companies furnishing power for irrigation from the payment of a certain portion of their taxes, but requires them to rebate the entire amount of this exemption to the individual farmer users.

The rebates range from $2.4064 per hp. used to $1.2904. This rebate will be paid to the farmers who have used the electric power during the 1922 irrigation season.

Part of the crowd that was present at the dedication of the new ornamental lighting and street-paving project in Denver, Colo. D. C. Bailey, mayor of Denver, addressed the crowd and threw the switch which closed the circuit for the first time

San Francisco Supply Company Prepares for Expansion

An issue of $250,000 capital stock has just been sold by the Atlantic-Pacific Radio Supplies Company of San Francisco, 85 per cent subscribed by present stockholders, for the purpose of financing its 1923 expansion program, which contemplates adding new radio lines to those the company is now distributing, greatly increasing the present sales force, and adding an electrical department, which will act as a distributor for standard electrical merchandise, working through recognized trade channels in the Pacific Coast and Rocky Mountain states. W. M. Deming, president and general manager of the company, who is largely responsible for this aggressive policy, is authority for the statement, and he says that representation of many additional lines, both radio and electric, have already been offered the company.

Mr. Deming is a national figure in the electrical industry, being the former publisher of the "Journal of Electricity," and now president of the Electric Supply Company of Memphis, Tenn., in addition to his present important capacity with the Atlantic-Pacific Radio Supplies Company. The company boasts of another well-known electrical engineer in the person of T. D. MacMullen, secretary and assistant general manager, who is also secretary of and director in the Majestic Electric Development Company of San Francisco, where he was sales manager until recently. Both Mr. Deming and Mr. MacMullen are enthusiastic over the company's new electrical department, and predict that in that industry it will soon attain a prominence which the company has already acquired in the radio field.

Those familiar with the radio business will remember that it was the Atlantic-Pacific Radio Supplies Company which named and marketed A-P vacuum tubes, and which more recently has received considerable publicity as distributor for a new type of receiving set. This device, it is claimed, will give most remarkable results even over long distances without using either an aerial or a ground connection.

Other radio lines now distributed by the company include Cutler-Hammer rheostats, Alden-Napier sockets and dials, Carter radio plugs and jacks, Dayton variometers and variocouplers, Westwyre variable condensers, Pacent electric plugs and jacks, and Philadelphia storage batteries, and A-P radio sets, parts and supplies, which the company manufacturers in its own plant.

Denver Christmas Sales Exceed All Previous Records

A volume of appliance sales greater than during any one month last year is reported for the two weeks which immediately preceded Christmas in Denver by the Electrical Cooperative League of that city. Electric shops, department and hardware stores, and the central station all experienced a rush developing from the electrical Christmas advertising campaign, and the results are confirmed by the depleted stocks of jobbers in that city.

A number of downtown electrical dealers along with the central station are said to have experienced record-breaking sales the day or two before Christmas. One dealer reported a hundred per cent increase over the previous year, while several said that their sales were 50 per cent greater than last year, when sales in electrical merchandise were greater than in other staple lines.

All seasonal stocks on the shelves of jobbers were exhausted almost a week before Christmas. Standard lines of appliances were depleted and as a consequence considerable obsolete merchandise was moved.

According to the jobbers in Denver, one of the primary factors responsible for the marked activity was the advertising campaign of the league. Seven full-page spreads of advertising appeared in the newspapers of that city in the two weeks prior to Christmas and considerable individual advertising was done between times along with the cooperative advertisements appearing over the name of the league.

In addition to the newspaper advertising another feature instituted by the league for the first time is said to have been the trimming and decorating of dealer-members' store windows along practical standard lines. The league staff, in conjunction with several manufacturers' specialists, worked on ten windows and changed a number of them at least twice during the two weeks. Attractive posters, streamers, and other features were provided by the league, although the cost of the individual window trims was stood by the dealer.

No outside interests were solicited in staging the campaign, it is said, all advertising and newspaper features having been prepared by S. W. Bishop, executive manager of the league, and his assistant, F. J. McEniry.

A petition for a certificate of public convenience and necessity to supply the Willits Valley and the town of Willits, Calif., has been applied for by the Central Mendocino County Power Company. In a second petition before the California Railroad Commission, the company has requested authority to acquire the electric plant of the Northwestern Redwood Company and the water plant of the Willits Water & Power Company. The price agreed on for both properties is $66,500.

Nevada Power Company Gets Lease on Generating Plant

Approval of the lease between the government and the Nevada Valleys Power Company of Carson City, Nev., for the Lahontan power plant was given to attorneys of the company by Director of the United States Reclamation Service Davis, and Secretary of the Interior Fall, just prior to the latter's resignation. The lease is to extend from 1924 to 1934 and in return for the lease the company is to abandon all claims for power rights on the Truckee River, near Vista, Nev.

The contract provides for certain improvements to the Lahontan plant which will increase the power efficiency and will broaden the service of the plant.

The Nevada Valleys Power Company supplies service to the Newlands Project, Fallon, Hazen, Lovelock and other Nevada towns. It is a subsidiary of the Canyon Power Company of California.

The Pacific Power & Light Company will spend $500,000 on development in Umatilla County during 1923. Plans call for the completion of the high line from Pasco to Pendleton via Umatilla, the construction of another lift on the Pendleton gas tank and for replacement work on the lines on Court street in Pendleton.

Install Electric Appliances for Domestic Science Classes

The South Washington Junior High School at Ogden, Utah, has installed complete electrical equipment in its Domestic Science Department. This equipment consists of 32 1000-watt Hotpoint Hughes hot plates and one No. 50 Hughes range.

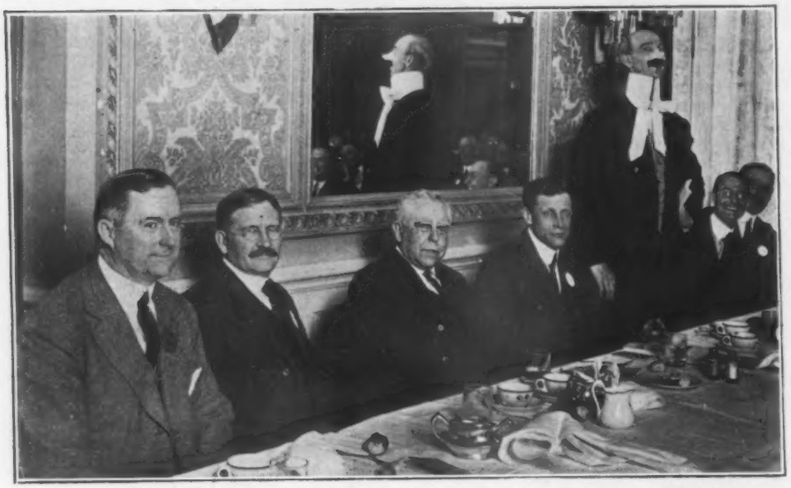
The hot plates are mounted on specially built fixtures manufactured by the Capital Electric Company of Salt Lake City, Utah. The instructors and pupils at the school are delighted with the operation of this new electrical equipment, and a keen interest is being taken in the domestic science branch of the school's activities.

Since this equipment was installed there has been a duplicate installation made at a new high school at Green River, Wyo.

Freshman girls ready for work in one of the domestic science classes of the South Washington Junior High School at Ogden, Utah

Public Officials Are Guests of Electric Club Members

When the Electric Club of Los Angeles held a Bureau of Power and Light Day, Andy Gump, "the man 100 per cent for the people all the time," was one of the guests at the speakers' table. The aspirant for Congressional honors has evidently come to recognize the political power of the electrical industry and has now tied himself with it.



Sitting at the speakers' table at the Bureau of Power and Light Day held by the Electric Club of Los Angeles, were (reading from left to right): T. J. Pace, manager supply division, Westinghouse Electric & Manufacturing Company, East Pittsburg; E. F. Scattergood, R. F. DelValle, H. W. Allen, Andy Gump, Carl Heintz and P. H. Booth, district manager Edison Electric Appliance Company.

The Bureau of Power and Light Day is an annual one with the Los Angeles Club. H. W. Allen, sales manager of the Graham-Reynolds Electric Company, presided at the meeting and later turned it over to R. F. DelValle, president of the Board of Public Service Commissioners, who acted as chairman of the day.

Carl A. Heintz, assistant electrical engineer in charge of distribution of the power and light bureau, and Ezra F. Scattergood, chief electrical engineer of the bureau, were the speakers. Both men presented interesting talks concerning the activities of the Bureau of Power and Light in Los Angeles.

Rate Schedule of Great Western Power Company Revised

Rates reflecting a reduction of approximately 10 per cent on the system as a whole were established for the Great Western Power Company of San Francisco in a decision recently announced by the California Railroad Commission. The rates are practically identical with the new rates of the Pacific Gas & Electric Company, and as in the case of the latter are entirely new, taking the place of existing rates and surcharge. The rate structure eliminates various discriminatory rates, and for that reason the percentage reduction is not uniformly applicable to all present charges. Flat rates are effective Feb. 1 and meter rates effective Feb. 20.

The rate of return that the company will earn under the new rates will not exceed 7.2 per cent, according to the estimate of the commission.

A special schedule is provided for electro-chemical service and railway power rates are made the same as those fixed for the Pacific company. The present flat rate for water heating being held unduly low, is closed to new consumers.

In general, the same principles of valuation and rate-making were applied to the Great Western as to the Pacific Gas & Electric Company. The historical reproduction cost method of arriving at physical valuation for rate-making purposes was used in both cases.

The rate base found reasonable is $40,144,479. Including items eliminated, the company claimed a rate base of $69,516,725. From the estimated cost of structural property there was deducted $1,783,000 on account of excessive expenditures in the construction of the Caribou plant and $1,323,000 on account of the exclusion from the electric system of the steam heating part of the company's business.

While the cost of the Caribou plant was reduced in the rate base, the company was commended for having undertaken this development when it did. At the time there was a downward trend of prices which, however, soon shot up to unprecedented heights. This, together with unforeseeable physical difficulties, caused the cost of this undertaking greatly to exceed the original estimate.

The Shorey Light & Power Company has recently filed articles of incorporation for $50,000, and will operate in Reedsport, Ore. The company will install and operate an electric light and power system for that town and nearby towns.

Application to the state engineer of Oregon has been made for permission to use water from the South Santiam River in Linn County, near Foster, sufficient to develop 1,023 hp. This power would be used by Almond A. White of Albany in connection with a logging road and sawmill.

Lumber Company Buys Large Block of California Timber

Timber in the Plumas National Forest, Calif., totaling 167,000,000 ft., has recently been sold to the Swayne Lumber Company for about $360,000. The timber covers about 14,000 acres in what is known as the sugar pine-yellow pine belt in the heart of the Sierra Nevada Mountains in California.

It has been estimated that the cutting of this timber, together with the inter-mixed privately owned timber, will require eight years to cut and convert into lumber. Twenty-one miles of railroad will be built to connect with an existing railroad 40 miles in length. The lumber company has been logging on private lands in this watershed.

The Elko Lamoille Power Company, of Elko, Nev., has recently completed the installation of a 365-hp. Busch Sulzer Brothers diesel engine at its plant at Elko. The engine is direct-connected to a 312-kva General Electric Company generator, which is direct-connected with an exciter.

Books and Bulletins

HENDRICKS' COMMERCIAL REGISTER

Published by S. E. Hendricks Company, Inc., 70 Fifth Ave., New York. $15.

The thirty-first annual edition of this valuable book for buyers and sellers has been considerably revised and enlarged so that there are few firms or products which cannot be found inside its covers. Especially devoted to the interests of the electrical, engineering, hardware, iron, mechanical, mill, mining, quarrying, chemical, railroad, steel, architectural and contracting industries, it forms a complete and reliable register of producers, manufacturers, dealers and consumers connected with these industries. Products are listed from the raw material to the finished article, with the concerns handling them from the producer to the consumer. It should be invaluable as a buyers' reference for anyone connected with these various industries. It should also prove of value in preparing mailing lists. One of the chief features which recommends this book is the indexing. Trades are indexed and classified as are trade names. Manufacturers are also listed alphabetically.

WHO'S WHO IN ENGINEERING

By JOHN WILLIAM LEONARD. 1,509 pages. Cloth. 6 by 10 in. $10. John W. Leonard Corporation, Brooklyn, N. Y.

This is the first edition of a biennial reference book containing biographical sketches of contemporary American and Canadian engineers. It contains concise but complete life statistics and professional records of 10,494 engineers. Most of the information contained in the book is nowhere else readily available. As a pioneer to fill a long-felt want, and as a highly creditable publication from every standpoint, it is certain to receive the support of the entire engineering profession.

Meetings

Rocky Mountain Electric League Elects New Officers

The second annual meeting of the Rocky Mountain Electrical Cooperative League was held at Salt Lake City, Dec. 4. The principal business transacted was the election of trustees for the ensuing year from the four branches of the industry. The members of each branch chose the following representatives to act as members of the board of trustees:

Central Station — S. R. Inch, P. M. Parry, H. M. Ferguson and R. M. Bleak, all of Utah Power & Light Company.

Manufacturers—Robert Miller, General Electric Company; W. A. Moser, Westinghouse Electric & Manufacturing Company; B. E. Rowley, Edison Electric Appliance Company, and S. S. Stevens, Stevens Sales Company, representing several manufacturers.

A. J. Calloway, newly-elected vice-chairman of the Rocky Mountain Electrical Cooperative League

Jobbers—J. A. Kahn, Capital Electric Company; C. B. Hawley, Intermountain Electric Company; J. D. Nicholson, Mine & Smelter Supply Company, and A. J. Calloway, Western Electric Company.

Electragists—Fred C. Wolters, Modern Electric Company; George R. Randall, Salt Lake Electric Supply Company; C. E. Dodge, Dodge Bros. Company, and E. H. Eardley, Eardley Electric Company.

A report of the league's activities during the past year was presented by P. L. Goddard, executive secretary.

Radio demonstrations and talks were also presented by J. G. McCollum, of the Intermountain Electric Company, and E. C. Painter, of the Capital Electric Company.

On Dec. 11, a meeting of the new board of trustees was held, for the purpose of electing officers of the league for the year 1923. At this meeting, also, the reports of various committees as to their activities during the past year were received.

The following officers were elected to serve during the ensuing year: chairman, W. A. Moser, Salt Lake City manager, Westinghouse Electric & Manufacturing Company; vice-chairman, A. J. Calloway, sales manager in charge of Salt Lake office of Western Electric Company; secretary and treasurer, R. M. Bleak, superintendent of lighting and appliance sales, Utah Power & Light Company.

Committees to Organize Annual Convention Announced

To arrange for the annual Pacific Coast Convention of the American Institute of Electrical Engineers, committees have recently been appointed by H. H. Henline, chairman of the San Francisco section. The convention will be held at Del Monte, Calif., the latter part of September.

Chairmen and members of the committees have already started to work making arrangements for the convention and it is the plan to have the organization of the program well under way by Jan. 26. It is planned to have a meeting of the committeemen before this time and a definite date for the convention will be considered at this time.

Professor Harris J. Ryan, of Stanford University, has been named general chairman of the convention and Robert Sibley has been appointed vice-chairman. The other committee members are as follows:

Papers Committee—S. J. Lisberger, Chairman; H. W. Hitchcock.

Arrangements Committee—W. C. Heston, Chairman.

Entertainment and Banquet Committee—W. B. Sawyer, Jr., Chairman; W. P. L'Hommedieu, Miss C. Grunsky.

Reception Committee—H. H. Millar, Miss C. Grunsky.

Registration and Transportation Committee—R. A. Balzari, Chairman; Henry Bosch, Jr.

COMING EVENTS

American Institute of Electrical Engineers—
Midwinter Convention—New York, N. Y.
Feb. 14-16, 1923

National Electric Light Association—
Annual Convention—New York, N. Y.
June 4-8, 1923

Pacific Coast Electrical Association—
Annual Convention—San Francisco, Calif.
June 19-22, 1923

California Contractor-Dealers to Meet in Sacramento

The first regular meeting of the California State Association of Electrical Contractors and Dealers for 1923 will be held at the Traveller's Hotel, Sacramento, on Jan. 27. For the accommodation of those members of the organization in the San Francisco Bay region a special boat has been reserved for the round trip, leaving Friday night, Jan. 26.

The program for the session will include a meeting of the executive committee on the morning of Jan. 27, a members' business meeting in the afternoon and a get-together meeting and dinner in the evening, to which all branches of the electrical industry have been invited.

Convention Dates Are Set by Electric Associations

The annual convention of the Pacific Coast Electrical Association will be held at the Fairmont Hotel, in San Francisco, June 19-22 inclusive. No definite plans for the program have been made as yet.

According to early reports, the convention of the National Electric Light Association will be held June 4-8, at the Commodore Hotel in New York City. The later date in June will permit officials of the national association to be present at the San Francisco meeting of the Pacific Coast electrical men.

Electric Club of Los Angeles Makes Orphans Happy

Aided by Jackie Coogan, the youthful screen star, the Electric Club of Los Angeles was host and Santa Claus to fifty-one orphans from the Kiddie Koop Home of the city. The Christmas celebration conducted by the club was held at the Goldberg Assembly rooms, which had been decorated for the occasion with a large electrically lighted Christmas tree.

The Saturday afternoon before Christmas was the day chosen by the club to make the orphans happy with presents, which corresponded to the requests that the children had made upon Santa Claus. A large papier mache orange, furnished by the California Fruit Growers' Association, became the center of attraction when Jackie Coogan emerged from its interior and aided Santa Claus in distributing the presents.

This is the second year that the Los Angeles club has given a Christmas party for the children. All through the past year the club has given financial aid to the home.

Second Annual Electrical Party Held by Denver League

Another successful electrical party is reported as having been staged in Denver by the Electrical Cooperative League of that city. In the interest of greater personal harmony and friendship, the league sponsored the social event and its success is reflected in the attendance of nearly two hundred couples.

Dancing and cards, entirely informal, were the attractions at the party, which was staged at the Albany Hotel the night of Jan. 9. Over a score of prizes, ranging from a vacuum cleaner to a flashlight, were donated by members of the industry as awards in the card games and special dances.

The success of a similar function a year ago warranted a repetition this year, according to the entertainment committee which handled both events. Clarence Keeler of the Denver Gas & Electric Light Company was the chairman of the committee and he was assisted by H. Alex Hibbard, secretary of the Denver Association of Electrical Contractors and Dealers, and H. W. Overbeck of the Mine & Smelter Supply Company.

Personals

Paul R. Jones, chief auditor and secretary of the Cities Service Company of New York, operators of the Denver Gas & Electric Light Company, is a recent Denver visitor.

H. E. Lane, director of the Joint Committee for Business Development, will be the chief speaker at an electrical dinner to be given in Denver under the auspices of the Electrical Cooperative League, Jan. 25, at the time of the national commercial section meeting of the N.E.L.A. in that city.

H. W. Reed, who recently was connected with Landers, Frary & Clark, is now connected with the Illinois Electric Company in Los Angeles.

Clotilde Grunsky, contributing editor of the Journal of Electricity and Western Industry, has been re-elected president of the San Francisco Business and Professional Women's Club.

T. H. Rhodes, formerly salesman for the Dallas branch of the Western Electric Company, has been transferred to the Los Angeles office of that company.

Lewis A. McArthur, general manager of the Pacific Power & Light Company, Portland, has been made vice-president of the company. Mr. McArthur was born in The Dalles, Ore., in 1883. He was educated at the Portland Academy, Portland, from which institution he was graduated in 1902, and subsequently was graduated from the University of California with the degree of B.S. in 1908. During his time in college, Mr. McArthur was editor of the Daily Californian, which at that time was the largest college newspaper in the United States. After graduation Mr. McArthur served as station agent and ticket clerk of the Oregon Electric Railway Company until 1910 and then he joined the

LEWIS A. McARTHUR

Pacific Power & Light Company as chief clerk and successively held the positions of purchasing agent, chief clerk to the president, assistant general manager and general manager. Mr. McArthur is an authority on geographic matters and on Oregon history, and was the recipient of an honorary degree of Master of Science and Public Service from the University of Oregon in 1921.

G. W. Barker, electric range expert of the San Francisco division of the Pacific Gas & Electric Company, has been promoted to the position of domestic appliance sales engineer, operating out of the office of the electric sales department of the company.

D. C. McClure, electrical superintendent of the Denver Gas & Electric Light Company, returned from New York just before the holidays after spending a month in the East in the interest of extensive improvements contemplated by his company.

Hugh H. Williams, a member of the New Mexico Corporation Commission, has been appointed a member of the federal and state legislative committee of the National Association of Railway and Utility Commissioners.

J. C. Hobrecht, Sacramento contractor-dealer, has been named chairman of the executive committee in charge of the annual Salvation Army drive for funds in Sacramento.

A. C. Cornell of the Western Electric Company, **H. D. Randall** of the General Electric Company, and **John J. Cooper** of the Mountain Electric Company and chairman of the Denver Electrical Cooperative League, have been appointed a committee to guide the finances of the Rocky Mountain Committee on Public Utility Information in the second year of its activities.

George F. Nicholson, chief engineer, Port of Seattle, and **J. W. Bowerman,** Seattle appraisal engineer, have been nominated for the presidency of the Seattle Chapter, A.A.E. The election will be held at the first meeting in January.

George W. Bernhard, formerly manager of the northwestern district of the Great Western Power Company and special agent at Sacramento, has been named district manager at Oakland to replace **F. H. Woodward,** recently made commercial manager of the company.

B. C. Holst, western manager for W. N. Matthews & Bro., Inc., has left for an extended eastern business trip. Before returning to his San Francisco headquarters Mr. Holst will visit his company's factory at St. Louis.

F. M. Stout, manager of the Denver office of the Celite Products Company, has been promoted to one of the eastern offices of the company. **J. P. Arnold** is now in charge of the Denver office of the company in the Symes Building.

G. L. Parker, district engineer of the water resources branch of the U. S. Geological Survey, was recently the guest and principal speaker at the monthly meeting of the Seattle Section, A.S.C.E. Mr. Parker presented a motion picture and lecture entitled "The Story of Water."

J. C. Jones, manager of the central station division of the Los Angeles Westinghouse office, is leaving Los Angeles for an extended trip through the East, visiting the manufacturing centers of the Westinghouse Company. While there he will visit the executive offices of the company at East Pittsburgh.

C. F. Oehlmann, an executive of the Denver Gas & Electric Light Company, and a prominent member of the Denver Motor Club, has been elected head of the Western Hills Auto Association, designed to promote automobile races of national interest during the Pageant of Progress in Denver next July.

T. L. Nudd, former electrical engineer with the Newbery Electric Corporation of Los Angeles, in charge of estimating and engineering, has been made electrical engineer for the Allied Architects of Los Angeles, supervising inspecting and estimating. Mr. Nudd began his career in the electrical industry in 1910 as a lineman for the Pacific Gas & Electric Company in the Solano district. He

T. L. NUDD

entered the University of California in 1912, and was graduated with the class of 1917 from the department of electrical engineering. Subsequently he became inspector of electrical material at the Mare Island Navy Yard, student electrical engineer at the Boston Institute of Technology and pilot in the U. S. Naval Flying Corps. Following the World War he was electrical inspector in the bureau of Yards and Docks, Navy Department, supervising electrical installations at the San Diego Public Works Office. He joined the Newbery Electric Corporation in 1920 as electrical engineer and held that position until his resignation. Mr. Nudd's connection with the Allied Architects of Los Angeles promises to be reflected in increased interest on the part of this body in the electrical features of homes and buildings erected under their supervision.

H. H. Hickman, sales manager for Haag Brothers Company, Peoria, Ill., has spent several weeks on the Pacific Coast analyzing western business conditions. Mr. Hickman visited Salt Lake City, Seattle, Portland, San Francisco and Los Angeles.

A. L. Dunmire, western representative for the Line Material Company, has returned to his offices at Oakland, Calif., after attending the annual sales convention of the company at Milwaukee.

Carl G. Schluederberg, assistant to the managers of the supply and merchandising departments of the Westinghouse Electric & Manufacturing Company and special representative of that company in foreign countries, left recently for a four months' trip in the Orient to study business conditions there. Mr. Schluederberg will visit Japan, the Philippines and China to make a sales survey, investigating especially the possibilities of expansion of the market for household appliances.

Fred Hazard, director of sales of the Conlon Electric Washer Company, Cicero, Ill., spent the holidays in Colorado.

Secretary Albert B. Fall, of the Department of the Interior, has announced his intention of resigning from President Harding's cabinet on March 4 to return to the practice of law and the conduct of his private affairs in New Mexico.

W. O. Hoeftmann, of the engineering department of the United States Steel & Wire Company, has been spending several weeks in San Francisco, preparatory to supervising the laying of the world's record high tension cable across San Francisco Bay by the Great Western Power Company.

W. A. Hillebrand, sales engineer for the Ohio Brass Company, and former professor of electrical engineering at Stanford University, delivered a highly interesting and instructive lecture before the joint meeting of the Portland sections of the American Institute of

James T. Whittlesey, prominent consulting engineer of San Francisco, has been appointed to a two-year term as commissioner on the California State Railroad Commission. After graduating from Yale he was with the Thompson-Huston Electric Company from 1889 to 1890. He then went to New York as consulting engineer and in 1892 he entered the services of the Brooklyn Street Railroad where he spent four years in the motor department. During the succeeding two years he was chief engineer of the Brooklyn Rapid Transit Company. In 1898 he became superintendent of the Stephenson Car Company of New Jersey. For three years following 1900 he was chief engineer of the United Electric Company of New Jersey and following this held the same position with the Public Service Corp., of New Jersey. In 1912 he removed to California and was retained by the Messrs. Spreckels of San Francisco to advise them in their large public utility interests. During the past five years he has been director of the Pacific Coast branch of the Engineering Business Exchange, with offices in San Francisco. In this capacity he has made engineering reports and investigations on industrial enterprises for interested clients. He is a member of the A.S.M.E., A.I.E.E. and the American Electro-Chemical Society. Mr. Whittlesey's many years of experience in engineering and public utility fields well qualifies him for his new work and his appointment satisfies a long-felt need for an engineer on the California commission.

JAMES T. WHITTLESEY

A. R. Wooley of the Edison Electric Appliance Company and **M. E. Lanning** of the Westinghouse Electric & Manufacturing Company, assisted the staff members of the Electrical Cooperative League in Denver in trimming the windows of dealer-members during the electrical Christmas campaign.

Clare N. Stannard, vice-president and general manager of the Denver Gas & Electric Company, has been appointed a member of the industrial advisory board recently appointed by William E. Sweet, governor of Colorado.

Hugh Gordon, attorney, and **Richard Sachse,** chief engineer of the California State Railroad Commission, are back from Washington, where they represented the commission in the final valuation hearings held before the Interstate Commerce Commission dealing with the Western Pacific Railway Company, Tonopah and Tidewater Railway Company and the Riverside, Rialto and Pacific Railway Company.

H. R. Noack, vice-president of the Pacific States Electric Company, with headquarters in San Francisco, was a recent visitor in Portland.

Louis R. Lee, chief engineer with the E. W. Clark & Company, Management Corporation of Columbis, Ohio, is spending two weeks with the Portland Railway Light & Power Company engineers going over the development plans for 1923.

Clare N. Stannard, vice-president and general manager of the Denver Gas & Electric Light Company, gave a short talk on the growth and development of the Cities Service Company at the weekly meeting of the Rotary Club in Denver, Dec. 14.

D. D. Sturgeon, an electrical contractor who is a member of the Denver Rotary Club, represented that organization at a meeting in Pueblo, Colo., Dec. 1, when representatives of all similar organizations in that state met to form a Greater Colorado Club.

Joseph P. Arnold has tendered his resignation as secretary of the Denver chapter of the American Association of Engineers to become the Rocky Mountain representative of the Celite Products Company.

David G. Ong, vice-president and general manager of the Gillespie-Eden corporation with headquarters in New York City, is a western visitor, having stopped in Denver and Salt Lake City before continuing his journey to the coast where he is visiting the representatives of his company.

George Flannigan, formerly associated with various Denver and Casper, Wyo., newspapers, has been appointed to the new department of public relations recently organized by the Western Light & Power Company with headquarters at Boulder, Colo.

Yashuhige Hayashi, managing director of the Uji River Electric Company and vice-chairman of the board of directors of the Nippon Electric Company of Osaka, Japan, has been spending several days in California making a study of high tension transmission systems. Mr. Hayashi is especially interested in the transmission of energy at 220,000 volts .

H. H. Corey, member of the Oregon Public Service Commission, has been appointed to the Western states transportation committee, representing western shipping interests.

Walter A. Moser, manager of the Salt Lake City office of the Westinghouse Electric & Manufacturing Company, has been elected chairman of the advisory committee of the Rocky Mountain Electrical Cooperative League for the coming year. Mr. Moser was born in Union Hill, N. J., in 1886. He was graduated from the department of electrical engineering of the University of Nebraska with the class of 1907. He completed two years' apprenticeship with the Westinghouse Electric & Manufacturing Company in 1911 and entered the Salt Lake City office in the sales department the same year. He was made district manager in 1920. The Rocky Mountain Electrical Cooperative League is one of the important factors in the West which carries the electrical message to the public. During the coming year, under his direction, the league proposes to enter into new fields.

WALTER A. MOSER

Obituary

Charles Perry Lindsley, vice-presi- of the Lindsley Brothers Company of Spokane, passed away at Hot Lake, Ore., Dec. 27, 1922, at the age of 55 years, after an illness of several months. Mr. Lindsley was also president of the Lindsley Brothers Canadian Company, Limited, at Nelson, B. C., and vice-president of the Barnes Lindsley Manufacturing Company, at Portland, Ore. He was one of the promoters of the Coeur D'Alene Electric Railway Company, the Pend d'Oreille River Navigation Company, and a pioneer in the lumber and cedar pole industries.

Frank Kivel, publicity manager of the Denver Gas & Electric Light Company for the last five years and prominently identified with utility advertising in the Rocky Mountain region, died in a sanitarium at Tucson, Ariz., Dec. 23, after a long illness. Mr. Kivel was a native of New Hampshire and his body was returned direct to his old home at Dover for burial. He was a member of the Psi Upsilon fraternity, a director of the Denver Advertising Club, a member of the University Club and of the Doherty Men's Fraternity, and also served on the publicity committee of the National Electric Light Association.

Manufacturer, Dealer and Jobber Activities

The Automatic Electric Heater Company of Warren, Pa., has recently started to make deliveries of its latest improved circulation type water heater. The construction of this heater differs considerably from previous models, in that the heating units are inserted from the top of the heater casting, instead of from the bottom. Another unique point in this heater is the use of separate 1,000-watt units instead of placing 3,000 watts all on one unit head assembly.

The Rawson Electrical Instrument Company, Cambridge, Mass., has recently issued Supplementary Bulletin No. 102. The bulletin describes the Rawson line of single-pivot meters. Descriptions and illustrations of the various types of portable testing instruments are contained in the bulletin.

The Esterline-Angus Company, of Indianapolis, Ind., has recently issued Bulletin No. 1122 which describes the necessity for making plant surveys.

The Westinghouse Electric & Manufacturing Company has recently placed on the market a new automatic sectionalizing contactor for railway and mining use that automatically cuts out of service feeder sections on which short circuits or overloads occur, and returns them into service again only when the trouble has been cleared. The contactor is entirely automatic in operation, opening on overloads and reclosing only when the potential difference between the feeder sections is sufficiently small to limit the flow of current on reclosure to less than the overload setting on a relay. An overload relay, a main contactor, a holding relay, a snap switch, fuses, a resistor, and terminals, are used in the construction of the new contactor.

The Youngstown Sheet & Tube Company, of Youngstown, Ohio, has prepared its annual calendar which gives illustrations covering the manufacture of steel in the modern plant. The calendar may be obtained by sending the company six cents in stamps.

The Manhattan Electrical Supply Company, Inc., of New York, has recently secured the services of K. M. Smith as general battery sales manager. Mr. Smith was formerly general sales manager of the Gould Storage Battery Company.

The Hart & Hegeman Manufacturing Company, of Hartford, Conn., has recently placed on the market a new line of push-button switches. The distinctive feature of the new switch is the star which is placed in the "current on" button. Gold star switches are marked with 14-karat gold stars and silver star switches have an "undark" star which is visible night or day. A solid close-fitting insulated dust cap is another improvement to the switch.

Graham-Reynolds Electric Company of Los Angeles, in accordance with their annual practice for the last five years, are distributing their 1923 calendars. The top piece of this calendar illustrates the transformation of the snow of the high Sierras into electric power for industrial Los Angeles.

The Electric Servant Company of Ogden, Utah, has filed articles of incorporation with the secretary of state. The capital stock is listed at $10,000 in $1 shares. Don L. Lenzi is president; Francis Cave, vice-president; A. K. Cross, secretary ,and Edna I. Lenzi and Vera Cave, additional directors. The company will carry on an electric appliance business.

The P. A. Geier Company, of Cleveland, Ohio, has moved its executive offices, sales offices and service department from the St. Clair Avenue plant to its plant at 540-560 East 105th Street. The old office space thus available, amounting to over 15,000 sq. ft., will hardly more than relieve congestion, and provision for further enlargement is being contemplated.

The Uehling Instrument Company, Paterson, N. J., has just issued a 12-page folder which explains concisely the two biggest losses in the steam power plant, namely (1) the loss in steam turbine economy due to air leakage into the condensing system, and (2) the sensible heat in the flue gases lost up the chimney. A table gives data on steam turbine economy as related to the absolute back pressure. The Uehling combined barometer and vacuum recorder, as illustrated in the folder, is in effect an automatic log of condenser performance because it records the existing vacuum as well as the absolute back pressure for every second of the day. Data on combustion are given in another table, such as the variation of the chimney loss with the percentage of CO_2 and its relation to flame temperature and ratio of air to fuel supply.

The General Electric Company has presented in Bulletin No. 44018 the principal characteristics of the several great rapid transit systems from an electrical engineering viewpoint. The facliities for power production, transformation, transmission and utilization are outlined briefly for each of the systems in the cities of Boston, Chicago, New York and Philadelphia. The company has taken a most important part in the manufacture of various types of apparatus for use on all of these systems. Exhaustive engineering studies and tests have been conducted by trained engineers to insure to each railway company the selection of exactly the proper equipment for the most reliable and efficient operation. The booklet contains a history of the part played by the General Electric Company in railway electrification.

The Illinois Electric Company of Los Angeles, Calif., has moved from 261 South Los Angeles Street, to 313-315 South San Pedro Street. The new location gives the company a much larger floor space.

The National X-Ray Reflector Company, in its publication of Eye Comfort, has recently presented illustrated descriptions of the lighting installations in the Dixie Terminal Building in Cincinnati, Ohio. The article is a reprint from Electrical World.

The Wesix Heater Company, of San Francisco, has moved its sales office from the factory to the Rialto Building in San Francisco. By removing the sales office from the factory additional space for manufacturing purposes has been provided.

IT'S THE ATMOSPHERE THAT COUNTS

Seldom is it possible to photograph four such celebrities as these with such studious expressions on their faces. The expressions were induced by the super-educational atmosphere they have been surrounded with on the campus of the Oregon Agricultural College. They might be taken for professors. Reading from left to right, they are A. C. McMicken, sales manager of the Portland Railway, Light & Power Company, J. I. Colwell, manager of the Seattle office of the Western Electric Company, George Boring, manager of the Portland branch of the Pacific States Electric Company, and R. C. Kenney, manager of the NePage-McKenny Company's Portland office.

Trade Outlook

San Francisco

The year 1922 was one of fulfillment in that its early promise of being a fair year in trade and industry was abundantly justified. Satisfaction arising from the surge forward during the year as evidenced by the new peaks in building and allied lines, gives the basis for the feeling that this activity will continue well into 1923.

Bank clearings for 1922 mounted to $7,274,000,000, an increase of $645,000,000 over 1921. Building permits for 1922 totaled $45,327,206, almost doubling those of the previous year. Frozen credits which prevailed a year ago have been liquidated, and financial relations are on a more normal basis.

Building activity has not shown any appreciable decline, and the construction of a number of new factories is about to start. Steel and furniture factories are working to capacity, and aluminum manufacturers expect a better year during 1923, as foreign competition is diminishing. Shipments of raw sugar from Hawaii during the year totaled 560,000 tons, and all of it came to this city to be refined.

Electrical supplies of all kinds show an increase in demand. The sale of water heaters has more than doubled during the year. A fair call is noted for radio supplies. In household appliances there is more competition than usual.

Denver

A successful wind-up to the electrical Christmas campaign and the completion of inventories has held the center of interest in this city during the past fortnight. Sales of appliances and all seasonal merchandise proved far beyond expectations and the results are primarily attributed to the intensive campaign sponsored by the electrical league here during the month of December.

Standard appliances were much in demand and with the depletion of new stocks, obsolete and cheaper appliances were moved in large quantities. Curling irons, percolators, and Christmas tree lighting outfits were cleaned out of dealers' stores and all jobbers report an unusually successful movement of merchandise. Sales are estimated as having been fifty per cent better than last year.

Through the ready movement of stocks, the taking of inventories has been facilitated. Orders on manufacturers have been placed anticipating a renewed activity in appliances early in the spring. Stocks in other lines are low due to the annual check-ups and with an unusually mild winter thus far continued good business is looked for.

Of unusual importance in the construction field will be the building of new schools, high and elementary, in this district, made possible by the passage of the bond issue last fall. Awards for the different buildings have been made to leading architects and the total program will cost nearly six million dollars.

Los Angeles

Nineteen twenty-three will be another great construction year for Los Angeles. Building projects already in sight aggregate in value more than the total for all building construction in 1920, which was a trifle over $60,000,000. That was a new high mark, but it was eclipsed by 1921, with a record of approximately $82,700,000, and 1922 rolled up the phenomenal total of $120,000,000. Building permits for the last fifteen days of December, 1922, had a valuation of $4,380,829—the number issued being 1,665, which is a gain over the same period in 1921 of approximately 25 per cent.

Bank clearings for the last 15 days of December, 1922, amounted to $248,079,254.01, which compares with the same period of 1921, with $206,202,267.17, as an increase of approximately 25 per cent. As has been fairly evident for some months would be the case, Los Angeles bank clearings for the year 1922 were over $5,000,000,000, the actual total being $5,152,311,839. This is an entirely new record, the figures being $941,115,042 in excess of those for 1921. It was, in fact, a year in which not only the yearly, but the monthly, weekly and daily records for payments through the banks were broken. December's total of $516,301,485 is the highest ever touched and compares with $407,624,463 for the corresponding month last year as an increase of $108,677,022. As December, 1921, was the first month in the history of the city when the monthly clearings crossed the $400,000,000 mark, so December, 1922, is the first when the total reached $500,000,000.

Salt Lake City

Dividends paid by Utah mining companies for the year 1922 show a slight increase as compared with those of 1921. While copper mining conditions during the year 1922 were unsatisfactory, the silver-lead producers had an excellent year. The ore output at Park City, Utah, one of the state's largest silver-lead camps, was greater during the past year than for any preceding year in the fifty years of the camp's activities. With the improved conditions in the copper situation, which now prevail, the mining industry in general will undoubtedly have a still greater period of activity during the coming year. Satisfactory mining conditions in the Intermountain section are reflected in greater prosperity for other classes of business and industry.

The retailers are now experiencing a lull after a very satisfactory holiday business. Electrical dealers are making strenuous efforts to "clean up" odds and ends and get rid of surplus stocks of various items in order to avoid carrying them over during the coming year. Practically all lines of trade, both wholesale and retail, report better business than last year.

Building activity has, of course, decreased very materially on account of winter weather. With the coming of spring, however, there will be more of such activity than for several years past.

Business men of this section are looking forward to 1923 with considerable optimism.

Portland

During the year just closed the Portland district showed in many lines the greatest activity in its history. All former building records were broken in 1922, not even excepting the high record made in 1910. The total value of all building permits for 1922 reached $22,734,875, of which over $12,000,000 was for dwellings. There are strong indications that the building activities during 1923 will be even more active than during the year just past.

The lumber industry has closed a profitable year. Due to the holiday period, during which many mills and camps are closed for general repairs, etc., the lumber production was light. Shipments continue somewhat below normal.

The clearings of Portland banks showed a comfortable gain over 1921 and totaled $1,600,507,594 for the year.

Retail buying during the holiday period, due to unpleasant weather, was slow at first but became very active just before Christmas. Many merchants were able to make a greater volume of sales than a year ago. The electrical Christmas idea was adopted by more shoppers than ever before. Jobbers and dealers in general are looking forward to a bigger business in 1923.

The one discouraging feature in the present outlook is the condition of the farmer. He is discouraged and the belief is growing that some economic adjustment must be made to better his condition. Better methods of production, longer credits, and cooperative marketing are the remedies being suggested.

Seattle

Every condition entering into the industrial situation in Seattle and the Puget Sound country points to a continuance of the prosperity prevailing during the last half of 1922, with excellent prospects for even further progress along industrial and manufacturing lines. During the past year, many records were smashed in Seattle's business field.

Seattle's building statistics for the year show that all former records were shattered in 1922, with a total of $19,784,010 in building permits issued. The building of homes has been the largest single item, with permits for approximately 2,000 dwellings issued during the year.

The electrical supply trade of the district reflects the general improvement in industrial and business conditions. Sales volume for the year, which mounted steadily during the last three months, greatly surpassed that of 1921. The number of large building projects started in the city, and the unusual activity in home construction, combined to swell the volume of equipment sales. Holiday buying in all lines was reported considerably heavier than in any previous year.

Construction News

Bridges

Ariz., Prescott—Roger Bros., Snowflake, were awarded contract by Yavapai County Highway Commission, at $30,001, for constructing steel bridge across Agua Fria near Black Canyon.

Calif., Riverside—Bids are being received by county supervisors for constructing wood trestle bridge 323 ft. long over Coachella storm water channel on Jackson St., Indio, to be known as the Sparey Bridge. Plans and specifications on file at office of A. C. Fulmor, county surveyor; certified check, 5 per cent. D. G. Clayton, clerk of the board.

Calif., Hamilton—A. W. Kitchen, Piedmont, submitted low bid at $88,238 for constructing reinforced concrete bridge across Stony Creek near Hamilton City, in Glenn County.

Calif., Los Angeles—City Engineer John Griffin has been instructed to prepare plans and specifications for a reinforced concrete bridge across Pacoima Wash at Mulholland Ave. The city will pay half the cost. The board of public works was authorized to call for bids for this work.

Calif., San Diego—Chas. S. Hardy, proprietor of a packing plant near Old Town, has proposed to the city council that the city build a $50,000 bridge across the San Diego River at Old Town. He offered $5,000 toward a bridge fund. The matter was taken under advisement.

Calif., Sacramento—The State Highway Commission has awarded a contract to O. B. Chaney & Sons, of Acampo, for the construction of a bridge over the Sacramento-San Francisco Short Line Railroad at Denverton, Solano County, on their bid of $12,540.

Ore., Portland—Work will be started soon on the new Ford Street concrete viaduct to replace the present bridge which gives access to Portland Heights and Council Crest. It will be about 500 ft. in length, with the main arch 250 ft. long and rising 90 ft. above Jefferson Street. The cost is estimated at $140,000.

Wash., Spokane—The Trent bridge contract has been awarded to J. W. Doust, of Spokane, on his bid of $60,370. The bridge is to be of cement and will be 422 ft. long. Construction is to start at once.

Wash., Vancouver—A new bridge is to be built across Salmon Creek on the Battle Ground highway. The cost of the bridge, which will be of steel and concrete, is estimated at $100,000.

Wash., Olympia—The State Highway Department has under preparation plans for a steel and concrete viaduct across the east fork of the Lewis River on the Pacific highway. The bridge will be 1,000 ft. long, and is estimated to cost $100,000.

Wash., Seattle—The Alaskan Engineering Commission, 422 Bell Street Terminal, will receive bids until Jan. 22, 1923, for furnishing one steel viaduct truss span and one steel girder span for various bridges on the Alaskan Railroad. The steel viaduct for bridge No. 1275 over Eagle River will be 308 ft. long, and will consist of two steel towers, two 40-ft. girder tower spans, two 74-ft. spans and one 80-ft. girder span. There will be one steel truss span for bridge No. 4679, over Noyes Slough, consisting of one through riveted steel span 124 ft. from center to center, and from end bearings. Bridge No. 2110 over North Channel of Montana Creek will require one steel girder span, the bridge to be a through steel span 60 ft. from center to center of end bearings.

Wash., Seattle—On a divided bid totaling $406,317.78, submitted by three separate firms, and complying with the plans and specifications embodied in specification No. 2, city design, the board of public works has awarded the contract for furnishing steel and the erection and completion of the superstructure of the West Spokane Street bridge, across the Duwamish Waterway, to the Bethlehem Shipbuilding Corporation, Ltd., the Gerrick & Gerrick Company, Seattle, and the Butte Electric & Manufacturing Company. The award to these three firms was made by the board following the reading of recommendations submitted by City Engineer J. D. Blackwell, who recommends the city design in preference to that of the Strauss Bascule Bridge Company. The winning bid of the three firms follows: Furnishing steel and delivering at bridge site, Bethlehem Shipbuilding Corp., Ltd., $276,871.14; erecting steel, The Gerrick & Gerrick Company, $106,151.64; furnishing electrical equipment, Butte Electrical & Manufacturing Co., $23,295. There were four propositions on which the contractors were requested to submit figures, as follows: Prop. No. 1, either city design or Strauss design, provides for furnishing and erecting, complete in place, superstructure, machinery and electrical equipment; Prop. No. 2 provides for furnishing only, delivered at bridge site, superstructure and machinery of the bridge; Prop. 3 provides for furnishing the electrical equipment of bridge and installing same; Prop. 4 provides for the erection of the superstructure and machinery only. The bridge will comprise a double-leaf bascule span approximately 288 ft. center to center of trunnions, two approach spans each about 140 ft. long and a steel girder span about 136 ft. long. The width of the bascule span will be 45 ft. center to center of trusses and of the side spans 52 ft., center to center of trusses, and of the girder span about 40 ft. Involved in the construction will be 3,850,000 lb. of bridge steel and 320,000 lb. of machinery.

Buildings (Industrial)

Ariz., Needles—The Santa Fe Railway Company is having plans prepared by its engineering department for a new ice plant to be erected at Needles. Reinforced concrete construction, structural steel, cork insulation; $250,000.

Calif., San Francisco—A permit has been granted to the J. D. and A. B. Spreckels Securities Company for the construction of what will be one of the largest warehouses in the West. The structure, estimated to cost $245,000, is to be one story in height and of steel and concrete construction, covering two city blocks, along Twenty-third and Delaware Streets. The building is to be used by the Western Sugar Refinery Company, a Spreckels corporation.

Calif., Hollywood—Architect Wm. F. Bowen, 813 Union League Building, is completing revised plans for an ice storage building at Santa Monica Blvd. and LaBrea Ave., Hollywood, for Home Ice Company. Stucco exterior, 40 x 78 ft., steel construction, concrete slab roofing, 42 ft. high, maple and concrete floors, cork insulation, high pressure piping, elevator and conveyors, steel beams, cooling tower, ornamental iron; $50,000.

Calif., Los Angeles—Architects S. Tilden Norton and Frederick H. Wallis, 330 Pacific Finance Building, are preparing plans for a 1-story warehouse to be erected on East 9th Street near Ceres Avenue, for Central Realty Company, Loew State Theater Building. Brick, 30 x 100 ft., pressed brick facing, composition roofing, cement floor, white enamel brick trimming, metal skylights, wire glass, Summerbell roof trusses, steel sash. Owner will take bids soon.

Calif., San Francisco—Barrott & Hilp, 918 Harrison St., have been awarded a contract on a percentage basis to erect a two-story reinforced concrete packing plant building on the north side of Townsend St., east of Fifth. Plans are being prepared by Architects Ward & Blohme, 454 California Street, Ruth-Winter & Walsh are the owners.

Calif., Oakland—The Paraffine Companies, Inc., of Emeryville, Calif., has purchased forty acres adjoining its property at the foot of Powell St., thus giving it a total of 65 acres, according to Manager A. A. Irving, and in the near future will enlarge its present plant. N. R. J. Rich is in charge of personnel work at the Paraffine plant.

Calif., Los Angeles—The refinery which will be built on Mormon Island by the Pacific Borax Company at a cost of about $1,500,000, will be an important addition to the industries at Los Angeles Harbor. The site is one formerly occupied by the Ralph J. Chandler Shipbuilding Company. Construction of the new plant will be started as soon as an order for the reinforcing steel has been placed. A 3-story reinforced concrete building, 305 x 250 ft., for the refinery has been planned by Architect A. C. Martin.

Calif., Los Angeles—Hamm & Grant, Ferguson Building, have completed plans and are commencing work on the erection of a 1-story factory building at 51st St., and Santa Fe Avenue., for California Enameling Company. It will be 300 x 600 ft., brick construction, steel sash, structural steel, composition roofing, cement floors.

Calif., Fullerton—Placentia Orange Growers Association plans to erect a pre-cooling and refrigerating plant on East Commonwealth Ave. Estimated cost $150,000. A. Pritchard, manager.

Calif., Modesto—J. S. West, local agent and grain dealer, announces that he and his associates will build an ice plant for both retail and wholesale distribution. Estimated cost, $40,000. The men are: J. S. West, Leslie High and N. S. West. A contract has been let.

Calif., Santa Ana—The Austin Company, 702 Pacific Electric Company, has prepared plans and has the contract to erect a 1-story laundry building at Santa Ana for the Southern Service Company. It will be 152 x 120 ft. with a wing, 45 x 120 ft; steel frame construction, brick walls, pressed brick facing, plate glass, steel roof trusses, saw tooth roof, composition roofing, metal sash, cement floors; $50,000.

Calif., Los Angeles—Comet Oil Company will build an oil refinery costing more than $1,000,000 on East 26th St., near Downey Road. The company includes Adolph Ramish, Michael Gore, J. J. Gans, B. Rosenburg and others. The capacity of the plant, which will serve Santa Fe Springs, Huntington Beach, Signal Hill, and Montebello, will be 2500 barrels a day at the start. The company is capitalized for $600,000.

Calif., Los Angeles—Union Ice Company of San Francisco, has applied to the harbor board for permit to erect a $400,000 ice plant at Mormon Island, L. A. Harbor, according to Edgar McKee, president of the Harbor Board.

Mont., Stevensville—A canning factory to cost $100,000 is to built in the Bitter Root Valley, on the site of the canning factory which burned in October. This is at Bass Spur on the Northern Pacific Railway. H. A. Johns is president of the Beaver Canning Company and is promoting the plan.

Ore., Portland—The Hurley-Mason Company is constructing a 50 x 100-ft. building at East 17th and Center Streets for a nitrous oxide factory. The new plant is to be owned by the Portland Oxygen & Hydrogen Company and will represent an investment of $35,000 to $40,000. There is no other factory of this kind in the

Pacific Northwest, the product having been shipped from Ohio.

Ore., Medford—The Southern Oregon Bi-Products Company will build a factory west of the city limits on the Jacksonville Railroad for the evaporation of fruits. Construction work will be begun on the dryer building soon after the first of the year and will be in readiness for the next season's crop.

Ore., Portland—Forty acres of land located near the Montgomery Ward & Co. building and adjoining the new freight terminal are to be improved by the Express Building Company of San Francisco with a group of large wholesale grocery warehouses costing, with the site, in the neighborhood of $2,000,000. Announcement of this development project was made by William C. Crittenden and E. Tropp, heads of the Express Building Company, who were in Portland recently in connection with the final transfer of the Wells-Fargo building from the San Francisco concern to Porter Bros., well-known railroad contractors. The 40 acres of land which are to be used as the site of the proposed building were taken by the Express Building Company as part of the purchase price of the Wells-Fargo building. Plans for the series of warehouses to be erected here are now being prepared, it was announced by Messrs. Crittenden and Tropp. They will cover an area of about ten acres and will contain a refrigerator plant, covered unloading station, so freight cars can always be under roof, as well as other modern improvements for the handling of a wholesale grocery business. Designs used for structures in San Francisco and Los Angeles will be adopted largely in the construction of the Portland buildings, it was declared.

Wash., Tacoma—Purchase of a 26-acre site of the old Tacoma Mill company and plans for the construction of a big lumber mill immediately have been announced by W. Yale Henry, formerly vice-president and general manager of the Clear Fir Lumber Company. A company has been incorporated, capitalized at $240,000, under the name of the Henry Mill & Timber Company.

Wash., Twisp—The Fender Lumber & Box Mills, here, plan the erection of a box factory, work to begin immediately.

Wash., Tacoma—Work is progressing steadily on the entire rebuilding of the Carsten's packing plant, of reinforced concrete. Two or three years will be required in the rebuilding, because daily operations are being continued.

Dams

Ariz., Tombstone—Engineer W. C. Elliott has presented to the directors of the San Pedro Water Users' Association, an estimate of the cost of building the proposed Charleston dam and works. The dams to be built at Charleston, about 10 miles from Tombstone on the San Pedro River. An election for a bond issue will be held in the spring. The cost of the dam, canal laterals, and ditches is estimated at $2,699,573.

Calif., Los Angeles—Public Service Department (Bureau of Water) has completed plans and specifications for a concrete dam to be built in Weid Canyon, back of Hollywood, to forms a storage reservoir for serving the higher reaches of Hollywood now served by pumping. The reservoir will be connected with the main line of the aqueduct joining it at a point near the tunnel into Franklin Canyon on the line of the main supply. A siphon will bring the water over the grade of the reservoir, which is located about one mile east of the summit of Cahuenga Pass, at the head of Holly Drive. The dam which will form this reservoir will be a gravity section dam, arched for additional safety and will be 195 ft. high, between 800 and 900 ft. in length, 160 ft. at the base, 16 ft. at the top, with a 24-ft. roadway, the overhang being supported on false arches which extend from the face of the wall to carry this additional width. Bids will probably be taken on sand and cement. All construction will be done by the Water Department forces under the direction of Chief Engineer William Mulholland. Preliminary work has been started on a road from the summit of Cahuenga Pass to the site.

Highways

Calif., Tulare—Tulare County Supervisors have plans under way for the construction of a 9-mile auto road connecting the north fork of the Tule River above Milo, with the south fork of the Kaweah River, east of Three Rivers, the gateway to the General Grant Park. County Surveyor Lawrence A. Moye is making a survey.

Calif., Sacramento—Contracts have been let by the state highway commission as follows: For paving with asphalt macadam 8½ miles between Granada and Yreka, in Siskiyou County, awarded to the C. R. Dennis Construction Company of McMinnville, Ore., on bid of $158,645; the highway engineer's estimate was $185,845. For grading about 9 1/3 miles between new and old county well at Plank Road, in Imperial County, awarded to George H. Oswald of Los Angeles on bid of $143,055, as compared to the engineer's estimate of $151,200

Calif., Sacramento—The following contracts have been awarded by the state highway commission: Highway in Glenn County, between Willows and a point three miles south of Glenn, about 11.9 miles in length, to be graded and surfaced with gravel; awarded to V. R. Dennis Construction Company, McMinnville, Ore., on a bid of $124,149.80. Highway in Placer County, between Roseville and Lincoln, about five miles in length, to be surfaced with asphalt concrete; awarded to J. A. Costello, Jr., San Francisco, on a bid of $35,530. Highway in Fresno County, between Parfield Junction and Coalinga, about 8.9 miles in length, to be graded; awarded to C. Miles, Sacramento, on bid of $120,803.25. Other contracts were awarded as follows: For 8.2 miles of grading and paving with apshalt macadam between Hollister and Pacheco Pass road in San Benito and Santa Clara Counties, contract awarded to the Granite Construction Company of Watsonville, on bid of $131,752.3b. For 14.2 miles of grading and paving with asphalt macadam between a point on the westerly boundary of Madera County and Califa, contract awarded to R. T. Shea of Riverside, on bid of $193,648. For 7.4 miles of grading between a point three and a quarter miles southeast from the Hueneme road and the Rindge ranch in Ventura County, contract awarded to the Hauser Construction Company of San Francisco, on bid of $598,085. Contract was awarded to Blumenkranz & Vernon, a Stockton firm, on a bid of $141,275, calling for the paving with asphalt macadam of a little over eight miles on the main highway between Morrison's Crossing and a point one mile south of Marysville. The stretch to be covered was originally paved under one of the first contracts ever awarded by the highway commission. Contract was also awarded for the grading and paving with concrete of a section 1.8 miles long between Hercules and Rodeo. The work will be done by Louis Tangnon of Vallejo, on a bid of $33,519.20.

Calif., Red Bluff—At an approximate cost of $175,000, the federal government next season is to build 10½ miles of the Susanville—Red Bluff state highway in the Mineral district. This is according to word received here through notices from the office in San Francisco of the district engineer of the United States Bureau of Public Roads. C. H. Sweetser, federal district engineer, states bids are to be advertised for about Feb. 1, and will be opened a month later. The work is to be done on a unit of highway about forty miles east of Red Bluff. The project, it is stated, consists of grading, structures unclassified, excavation of 150,000 cu. yd., and the building of one steel truss bridge of a 70-ft. span. It is to be a combination station-man and team job.

Ore., Florence—Bonds to the amount of $150,000 have been sold by Lane County to cover the costs of clearing and grading an 18-mile section of the Coast highway between Blachly and Rainrock. The clearing which is through heavy timber will start soon and will be done by the county on force account.

Ore., Eugene—Contracts for the construction of the Goshen-Lowell section of the Willamette highway, the Cheshire-Goldson section of the Florence highway and the Lost Creek bridge on the Willamette highway were recently assigned. In the order above named the contracts went to the Warren Construction Co., Goshen-Lowell section for $82,571. A. C. Mathews of Eugene, the Cheshire-Goldson for $40,920. E. D. Olds will build the Lost Creek bridge for $9,033.

Ore., Salem—More than 80 miles of road work, aggregating almost $1,000,000, has been ordered advertised for the Jan. 19 meeting of the state highway commission. The projects are as follows: Oregon caves road, Bear Creek section, grading, 3 miles. Hayden Creek—Jackson County line, surfacing, 9.8 miles. Grass Valley—Wasco County line, grade and surface, 20.2 miles. Klamath Falls—Keno, grade and surface, 11 miles. Tygh grade section of The Dalles-California highway, grade, 6 miles. Eugene-Goshen, resurface, 4.8 miles. Allen ranch—South, The Dalles-California highway, grade, 8 miles. Approach fills, Rhinehart overcrossing, 0.26 mile. Tumalo section, grade and surface, 1.4 miles. Cline Falls—Redmond, grade and surface, 5 miles. Port Orford—Sixes River, Roosevelt highway, grade 3.3 miles; surface, 6.1 miles. Dike section west of Coquille, Roosevelt highway, grade, 2.4 miles.

Wash., Tacoma—Pierce County Commissioners awarded the contract for 3 miles of paving of Bond Road No. 8, near Buckley, to C. H. Collins, Arlington, on his bid of $57,797, the lowest of eight bids submitted.

Irrigation Projects

Calif., Oxnard—Zone No. 1 Mutual Water Co., and Zone No. 2 Mutual Water Co., will install 12 miles of concrete pipe on the old Montgomery walnut orchard and Balcom Canyon road on the east, within the next few months. The present companies originated with the Las Posas Water Company, but now are independent. These two companies will look after irrigation waters from the Simi Creek and wells near the creek. A large reservoir will be constructed near Somis, 15,000 ft. of steel pipe will be used in pumping water from Simi Creek and wells to reservoir. Cost, $350,000.

Nev., Reno—The Carson Valley Irrigation District filed application with the state engineer for authority to appropriate sufficient water from the east fork of the Carson River to irrigate 24,000 acres. Permission was requested from the Department of Water of the Board of Public Works of California for authority to erect a storage reservoir at the headwaters of the west fork of the Carson River in Diamond Valley, Calif. The enterprise includes irrigation of 45,000 acres including 16,500 acres of reclaimed sagebrush land, with the lands located near Gardnerville and Minden. It will require about ten years to complete the reservoir, dam and canals, etc.

Ore., Bend—Contract for reconstruction of the central Oregon irrigation district main flume south of Bend has been awarded to the Warren Construction Company on a bid of $136,098.90. Creosoted wood stave pipe will be used.

Wash., Yakima—Construction work on a pipe line from the Sunnyside canal to a point on Snipes mountain, where it will discharge into an open canal to be diverted to irrigate 1,600 acres of land on the Granger project will be started about Feb. 15. The pipe line will form

an inverted siphon, 13,800 ft. in length and 33 in. in diameter, and will cost about $150,000. It will be reinforced concrete, built in eight sections with lock joints. Work will be carried on by the U. S. Reclamation Service.

Power Projects

Calif., Glendora—Southern California Edison Company has appropriated about $20,000 to rebuild local electric light and power system in Glendora. For the initial part of the program there will be required 60,000 ft. 3/16 in., 40,000 ft. ¼ in. and 10,000 ft. 7/16 in. wire, 250 poles. Fred Schwartz, district manager.

Calif., Oakdale—With the adoption of the resolution approving the estimates of the engineers for the Melones reservoir and power plant, the total cost of which is fixed at $3,750,000, the Oakdale and South San Joaquin irrigation districts will at once ask the state bond commission for approval of their plans and permission to call a bond election. Engineers Hartley & Wood filed a report approving the plans of Engineer A. J. Wiley, which was the final step needed. The total cost of the dam and of the rights-of-way, etc., is estimated at $1,984,000, and of the power plant at $1,516,000.

Calif., Long Beach — The Nevada-California Electric Corporation will spend more than $8,000,000 within the next ten years in constructing new plants. Seven new hydroelectric plants which will give an added capacity of 46,500 hp., will be built to supply power to Nevada mining industries and agricultural districts in southeastern California.

Wash., Walla Walla—The Pacific Power & Light Company plans the expenditure of approximately $500,000 in improvements to its properties during 1923, according to C. S. Walters, manager. The most important of the improvements planned is construction of a new transmission line from Pasco to Pendleton, to connect with the 25,000-volt line from Pendleton to Walla Walla, insuring double service in Walla Walla. This improvement will cost $450,000. Other expenditures planned are $10,000 for reconstruction of part of the local distribution service, $25,000 for rebuilding the pipe line at the Walla Walla River plant, and $13,500 for smaller improvements.

Wash., Okanogan—A power line is to be built by the Washington Water Power Company into Chelan and Okanogan counties from a junction with the end of the present Big Bend line at Coulee.

Wash., Colville—The Stevens County Power & Light Company will extend its wire service for three miles south of Kettle Falls.

Railways

Calif., Los Angeles—Continuing its policy of linking Los Angeles and Chicago with two distinct parallel lines, the Santa Fe Railway has approved the immediate building of a double track between Dagget and Bagdad, desert stations in San Bernardino County, a distance of 68 miles at a cost of $3,000,000. This will be the greatest extension program in the Santa Fe's history in California since the laying of the transcontinental line.

Calif., San Francisco—Contracts for construction of 5,030 standard refrigerator cars for the Pacific Fruit Express Company have been awarded, according to announcements by C. M. Secrist, vice-president and general manager of the company. Of the 5,030 cars, 1,030 will be constructed in the West, the Pacific Car and Foundry Company of Portland and Seattle getting the contract for that number. The Pacific Fruit Express Company in 1923 will have between 28,000 and 29,000 cars to be used in the fruit and vegetable business originating in the states of California, Oregon, Washington, Idaho, Utah, Colorado, Arizona, Texas and Louisiana, on the lines of the Southern Pacific and Union Pacific, joint owners of the Pacific Fruit Express Company.

Calif., Oakland — The San Francisco-Oakland Terminal Railway Company has closed a contract for the purchase of 55 all steel street cars to cost approximately $800,000 with the American Car Company of St. Louis. The cars will be equipped with the latest proven safety devices. They are to be delivered in April or May.

Calif., Glendora—Ordinance No. 234, passed by board of trustees, granted Pacific Electric Railway Company a permit to construct an electric railroad and spur over Dalton Avenue, North Benna Avenue, Foothill Blvd., East Ada Ave., etc.

Colo., Denver — Allison Stocker has been awarded contract to build car barns for the Denver & Interurban Company at 36th and Fox Streets; price, $35,000.

Wash., Yakima—Two hundred thousand dollars will be spent by the Northern Pacific Railroad in construction of new freight and passenger stations in the Yakima Valley next year, according to Harry Glen, general agent. They include a freight and passenger depot at Harrah, $6,000; a combination at Wapato, $50,000, and a new freight depot in this city.

Streets and Sewers

Calif., Watts—J. G. Beckjord, 718 San Fernando Building, Los Angeles, was awarded contract at $445,000 for constructing city sewer system, under new proceedings. The contract was previously awarded to Thompson & Packard, of Salt Lake City, but owing to errors in the proceedings, they refused to sign the contract. Old proceedings were then abandoned and the new resolution adopted Nov. 14.

Calif., Fullerton—The bond issues for outfall sewer carried at the recent election. The $75,000 issue was to pay city's share of cost of joint outfall sewer to the ocean. The $175,000 issue was for sewer line connecting with the Anaheim main line to joint outfall to be constructed by the cities of Santa Ana, Anaheim, Fullerton and Orange.

Calif., Coronado—City Manager Hyatt has recommended the installation of a septic tank costing approximately $25,000 as one way to solve the sewer problem of Coronado. The city manager has been authorized by the trustees to secure all necessary information on costs and material.

Calif., Claremont—Olmsted & Gillelen, Hollingsworth Building, Los Angeles, have submitted to city council an estimate of the cost of the proposed sewer outfall to care for Claremont for 40 years. The estimate totals $139,000 and includes $99,000 for lateral system, $27,000 for outfall, and $12,000 for disposal plant to be located in the San Antonio Wash. Specifications call for main outfall sewer of 18-in. pipe, two main lines 10 and 12 in., and laterals, 8 in. in diameter. W. S. Smith, city engineer, Claremont, has the matter under advisement.

Calif., Los Angeles—Board of Public Works has requested City Council to grant permission to sell $2,000,000 of $12,000,000 sewer bond issue voted last August. Of this sum, $795,000 will be required for the temporary outfall and first three units of the emergency treatment plant or the extension of the pipe line to the sea in the case Venice will join Los Angeles in this disposal; $181,000 for Section 2 of the north outfall, which is for grading the Hyperion treatment plant site; $192,000 for screens, concrete and connecting sewers for south plant of Section 3.

Calif., San Diego—City council has decided to call a $3,000,000 bond election in the spring to install new water mains in San Diego.

Calif., San Francisco—The West of Powell Improvement Association has decided to replace gas lamps with electric lights on Turk Street from Market and Mason Streets to Van Ness Avenue, and on Eddy Street from Powell and Market Streets to Jones Street. D. L. Randolph is president of the association.

Wash., Seattle—A bill passed by the city council recently provides for the regrade of the north end of Beacon Hill, from Dearborn Street to Judkins Street, at an estimated cost of $750,000. The bill also provided for the filling of Ninth Avenue South and other streets and avenues in the district, with the material sluiced from Beacon Hill.

Wash., Seattle—Contract for paving of Eleventh Avenue North, et al., has been let to R. G. Stevenson, on his bid of $25,859. Mr. Stevenson, on his bid of $14,210, was awarded contract for water mains in 24th Ave. N. W., et al.

Wash., Seattle—Contract for drainage system in Wetmore Slough, providing for covered ditches at Genessee Street and open ditch in garbage fill, has been let to Thomas Hansen, on his bid of $19,005.

Wash., Seattle—For the second time, the contractors on the Alki Avenue paving project, involving more than $100,000, have been released from their contract, and new bids will be called within 30 days for the work. In both cases technicalities in passage of the ordinance caused the release.

Wash., Tacoma—The proposed South Tacoma sewer project, estimated to cost $950,000, has been indefinitely postponed by the city council, following a storm of protest from property owners in the district.

Waterworks

Calif., San Bernardino—City council passed Ordinance No. 933, which calls for a special election to be held at San Bernardino, Jan. 25, to vote on $140,000 water bond issue. These bonds will be used for erection of water works, pumping plants, wells, reservoir, etc.

Wash., Jefferson—A bond issue of $15,000 has been voted by residents of this city for improvements to the water system.

Wash., Mulkiteo—The main distribution system of the Mulkiteo water district has been completed by H. W. Troutmann Company of Seattle, at a cost of $13,000. The completed system includes mains laid in the town proper, and a pumping station, but does not include the entire system, for which $57,000 was voted, and which contemplates the laying of mains south of Mulkiteo for agricultural districts.

Wash., Aberdeen—Bids will be received shortly by the city council for over 5,000 lin. ft. of 16-in. cast iron water pipe, to be used in installing an additional central service main to be extended from the reservoir to feeders which extend to every point in the city's water system.

Calif., San Rafael—The Pacific States Gas & Electric Company is contemplating improvements to its local plant, which will include changing present storage holder, the erection of a new 500,000-cu. ft. holder, the erection of a new warehouse, machine shop, garage, meter shops, transformer shed, filling station, etc.; the cost is estimated at $139,600. An 8-in. gas main from the San Rafael gas plant to Petaluma will be laid, to cost approximately $215,750.

Ore., Webak—A cement plant is to be erected in this vicinity as a result of the decision of the public service commission fixing the rate of shipment at 17½c. per 100 lb., the minimum carload to be 80,000 lb. The cost of the new plant will be approximately $1,000,000.

Wash., Bremerton—(Pier)—Henry & McFee, general contractors, Northern Life Building, Seattle, with figures of $440,000 and $392,000, submitted the low bids to the Bureau of Yards and Docks, navy department, Washington, D. C., for the construction of the proposed extension to Pier No. 4 at the Puget Sound Navy Yard, Bremerton. The only other bidder, J. A. McEachern Company, Inc., Colman Dock, Seattle, bid $473,000. The project involves the construction of an extension 720 ft. long and 80 ft. wide, of reinforced concrete construction, on concrete cylinders.